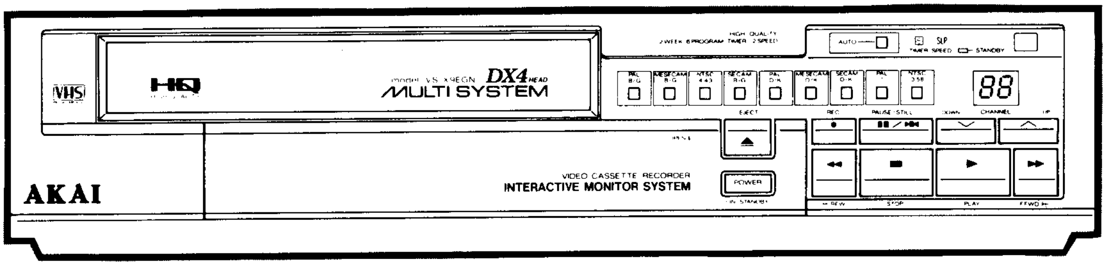
AKAI SERVICE MANUAL



VIDEO CASSETTE RECORDER

MODEL VS-X9EGN

SPECIFICATIONS

Format	VHS standard
Video recording system	Rotary, slant azimuth two-head helical scan system
Rotary heads	DX4 video heads
RF input	System B/G, D/K, I, M
(Europe ch.)	VHF ch 2 – 4, S1 – S10, 5 – 12, S11 – S20 UHF ch 21 – 69
(USA ch.)	VHF ch 2 – 6, 7 – 13 UHF ch 14 – 83 CABLE ch A-1, A-2, A – I, J – W
(Japan ch.)	VHF ch 1 – 3, 4 – 12 UHF ch 13 – 62
RF output	B/G, I, M, D/K type modulation
(PAL)	UHF ch 30 – 39 adjustable (preset ch 36)
(NTSC)	UHF ch 26 – 38 adjustable (preset ch 34)
Recording (line input)	PAL (System B, G, I) SECAM (SECAM or MESECAM tape) NTSC 3.58 MHz NTSC 4.43 MHz
Playback (line output)	PAL SECAM (SECAM or MESECAM tape) NTSC 3.58 NTSC 4.43
Video	
Line input level	0.5 – 2.0 Vp-p/75 ohms, unbalanced
Line output level	1.0 Vp-p/75 ohms, unbalanced
S/N ratio	more than 45 dB
Horizontal resolution	
PAL	more than 250 lines
SECAM (MESECAM)	more than 220 lines
NTSC (SP MODE)	more than 240 lines

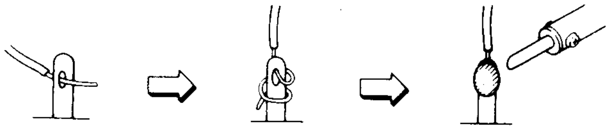
Audio	
Line input level	–8 dBm/50 K ohms, unbalanced
Line output level	–6 dBm/ 1 K ohms, unbalanced
S/N ratio	more than 40 dB
Frequency response	70 – 10,000 Hz (SP mode)
Recording/playback time	
NTSC	160 min. with T-160 cassette on SP mode
NTSC	480 min. with T-160 cassette on SLP mode
CCIR	240 min. with E-240 cassette on SP mode
Tape speed	
NTSC SP mode	33.35 mm/sec. (1-5/16 i.p.s.)
SLP mode	11.12 mm/sec. (7/16 i.p.s.)
CCIR SP mode (only)	23.39 mm/sec.
Quick finder	
NTSC SP mode	approx. 3 times normal speed
SLP mode	approx. 9 times normal speed
CCIR SP mode (only)	approx. 3 times normal speed
FF, REW time	approx. 5 min. with E-240 cassette
Timer	
Program	6 program/2 week and sleep timer
Clock reference	Quartz crystal
Display	TV screen (Tape counter, Timer etc.)
Power requirements	110 – 250 V AC, 50/60 Hz
Power consumption	27 W
Operating temperature	5°C – 40°C
Dimensions	425 (W) x 95 (H) x 345 (D) mm (16.5 x 3.7 x 13.4 inches)
Weight	5.9 Kg (13.0 lbs)

* For improvement purposes, specifications and design are subject to change without notice.

★SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

1. Parts identified by the ⚠ symbol parts are critical for safety. Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation.
   These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locatoins.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

SAFETY CHECK AFTER SERVICING

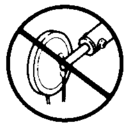
Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 M ohms. but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for C or A, specified insulation resistance should be headphone jacks line-in-out jacks etc. more than 2.2 M ohms (ground terminals, microphone jacks).

PRECAUTIONS FOR LITHIUM BATTERY

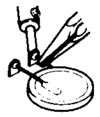
The lithium battery may explode when heated excessively.

[OBSERVE THE FOLLOWING WHEN REPLACING]

- Replace with the same make and type only.
- Use soldering iron in "recommended way" only.
- Place battery in correct polarity.
- Do not short the terminals.
- Do not recharge battery.
- Do not dispose of battery in fire.



[DANGER]



[RECOMMENDED WAY]

★INFORMATION

SYMBOLS FOR PRIMARY DESTINATION

Alphabet indicates the destination of the units as listed below.

Symbols	Principal Destinations
A	USA
B	UK
C	Canada
E	Europe (except UK)
J	Japan
S	Australia
V	W. Germany only
U	Universal Area
Y*	Custom version

VOLTAGE CONVERSION

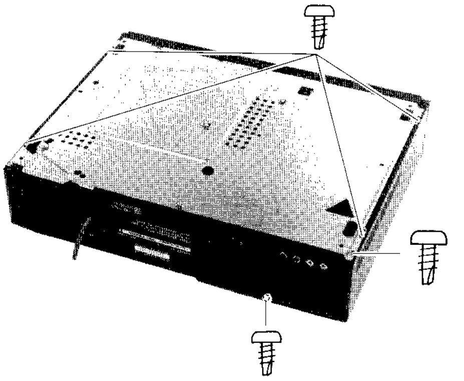
A switching regulated power supply has been employed for the VS-X9EGN.

The arrangement has enabled to operate at a broad range of mains power voltages (110V AC to 240V AC) without any voltage switching requirements.

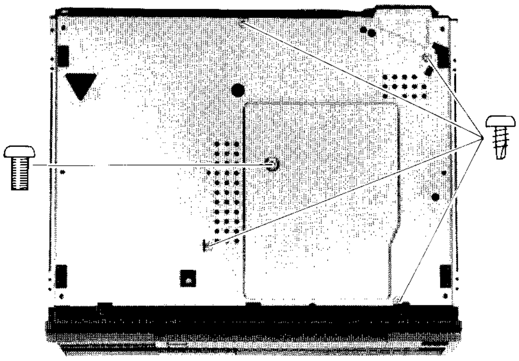
I. DISASSEMBLY

In case of trouble etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.

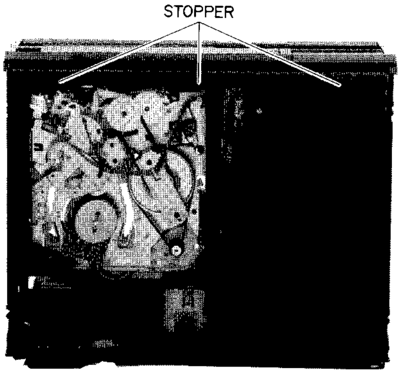
1 Removal of Upper Cover



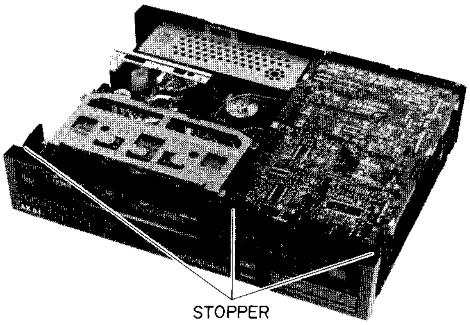
2 Removal of Bottom Cover



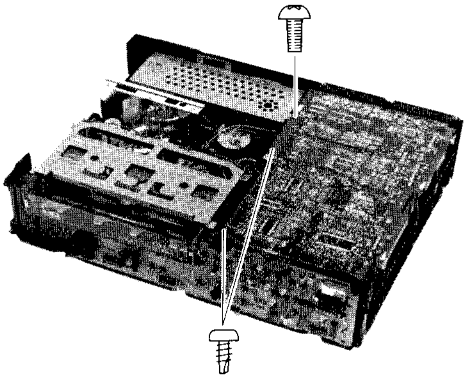
3 Removal of Front Panel



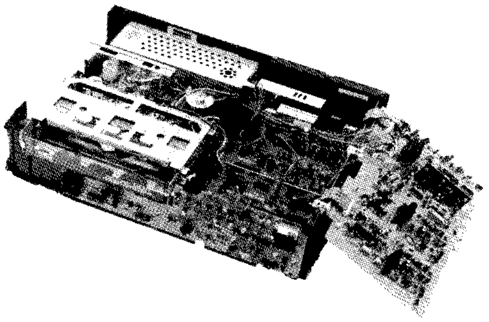
4



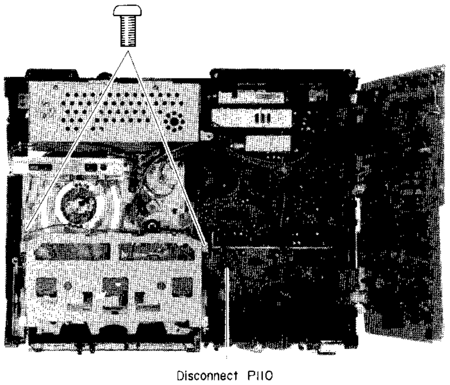
5 Removal of Video PCB



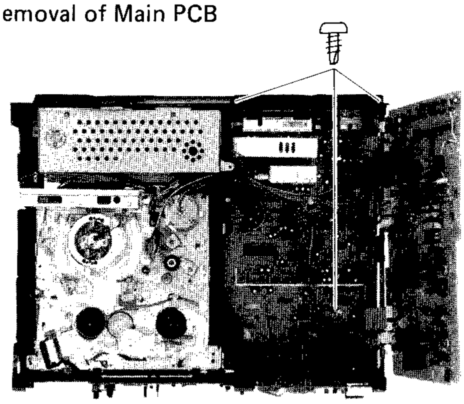
6



7 Removal of Ejector Block



8 Removal of Main PCB



II. CONTROLS

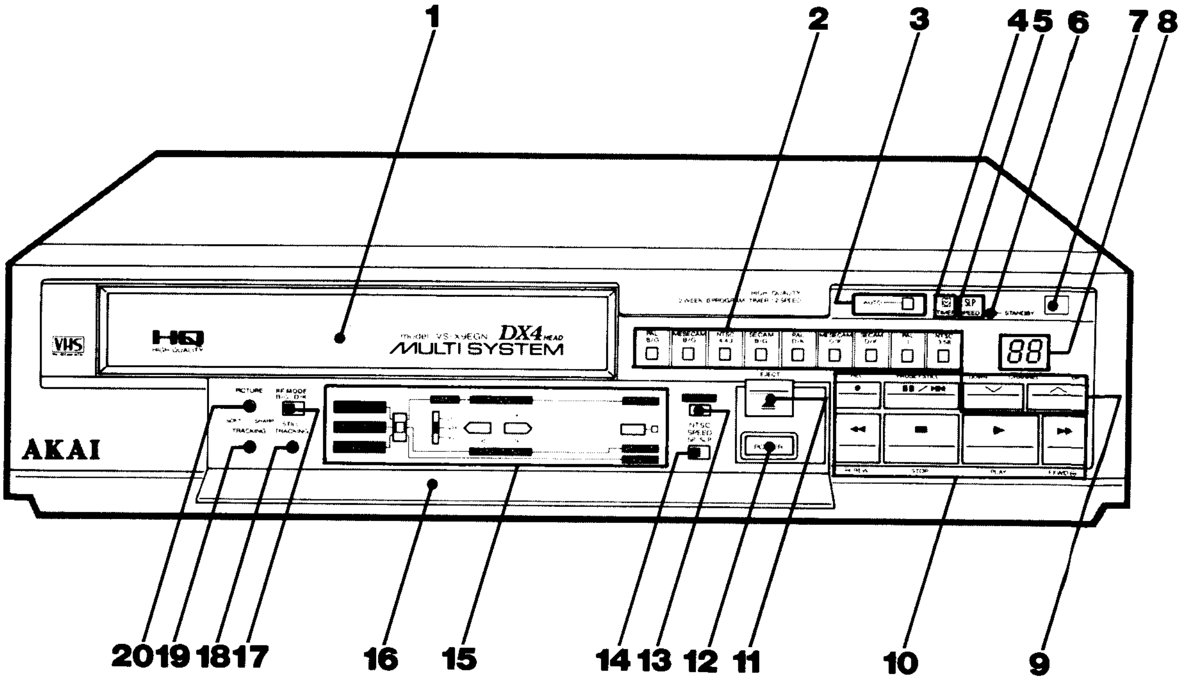
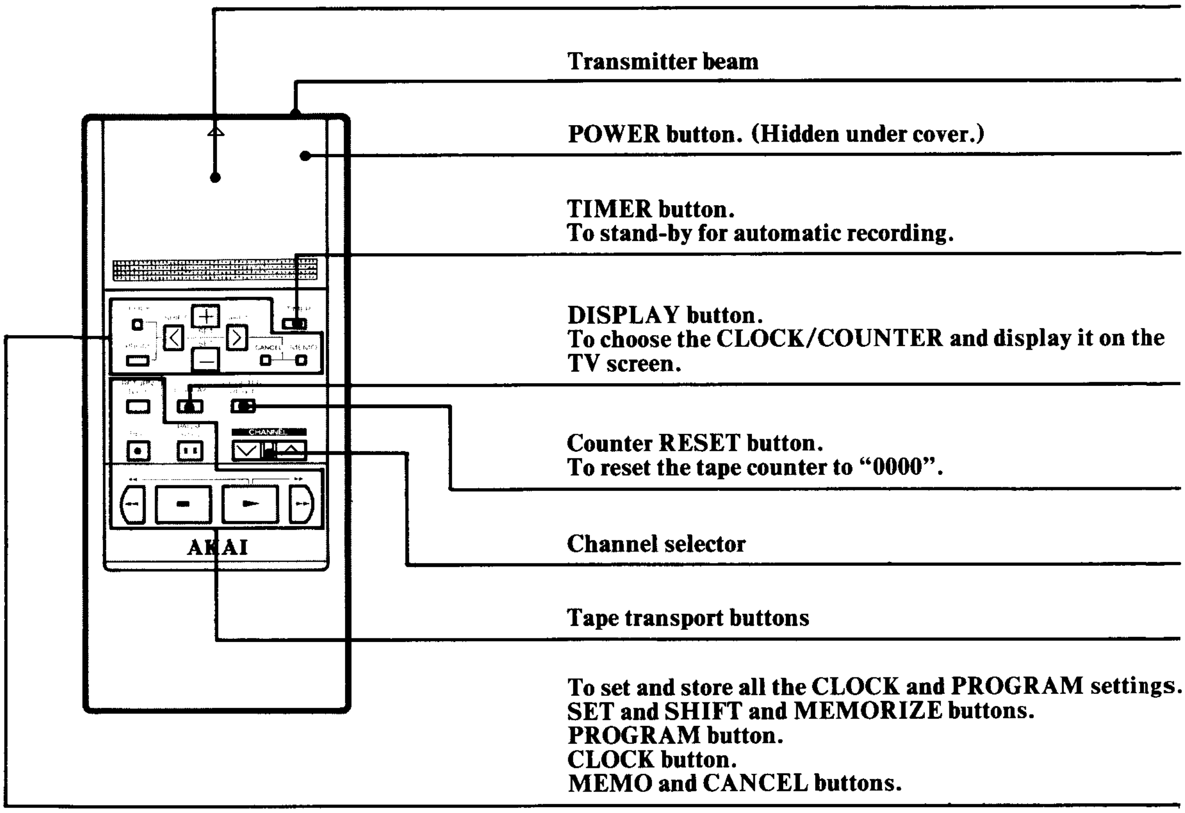

1
2
3
4
5
6
7
8
VHS
HQ
HIGH QUALITY
DX4 HEAD
MULTI SYSTEM
HIGH QUALITY
2 WEEK 6 PROGRAM TIMER 2 SPEED
AUTO
SLP
TIMER
SPEED
STANDBY
PAL B/G
MESECAM B/G
NTSC 4.43
SECAM B/G
PAL D/K
MESECAM D/K
SECAM D/K
PAL I
NTSC 3.58
88
AKAI
PICTURE
RF MODE B/G D/K
SOFT
SHARP
TRACKING
STILL TRACKING
NTSC SPEED SP SLP
EJECT
POWER
REW
STOP
PLAY
F.FWD
20
19
18
17
16
15
14
13
12
11
10
9

Fig. 2-1

1. **Load the video cassette tape here.**
2. **Multisystem selectors and indicators.**
   To select the broadcast system.
3. **Multisystem AUTO selector.**
   To set the VCR for automatic system selection.
4. **TIMER indicator.**
5. **Tape Speed indicator (For NTSC system only).**
6. **STAND-BY indicator.**
   Tells you the power cord is plugged in and the power switch is on.
7. **To receive the remote control signal from the Akai Remote Control Unit.**
   * Keep this window clean for remote control operation.
8. **CHANNEL display.**
9. **CHANNEL selector.**
   To select a preset channel with the built-in tuner of the VCR.
10. **Tape transport buttons.**
    To run the tape for recording or playback.
11. **EJECT button.**
    To eject the video cassette tape.
12. **POWER button.**
    To turn on and off the Akai VCR.
13. **TIMER button.**
    To stand by for automatic recording.
14. **Tape Speed Selector.**
    (For NTSC system only.)
15. **Tuning controls.**
    To tune in preset channels.
16. **Tuning control cover panel.**
17. **RF MODE selector.**
    To select B/G or D/K RF Output.
18. **STILL TRACKING control**
    To fine tune the STILL playback picture.
19. **TRACKING control.**
    To fine tune the play back picture.
20. **SHARP/SOFT PICTURE control.**
    To soften or sharpen the video picture.

The remote control contains operation buttons which are used the same way as the operation buttons on the front panel of the Akai VCR, and many which appear on the remote control only. The remote control can be used from a distance of up to 5 meters.



Channel number buttons. (Hidden under cover.)
Use these buttons for immediate access to any station without scanning the whole band. For single digit stations, press"0" and the number, or just the number itself.

Transmitter beam

POWER button. (Hidden under cover.)

TIMER button.
To stand-by for automatic recording.

DISPLAY button.
To choose the CLOCK/COUNTER and display it on the TV screen.

Counter RESET button.
To reset the tape counter to "0000".

Channel selector

Tape transport buttons

To set and store all the CLOCK and PROGRAM settings.
SET and SHIFT and MEMORIZE buttons.
PROGRAM button.
CLOCK button.
MEMO and CANCEL buttons.

Fig. 2-2

Saftey Lock System

This VCR can be locked to prevent access by small children. This feature can be operated by the **remote control only.**

To lock: With the VCR POWER ON, depress and hold the remote control's STOP button for about 4 seconds. An "L" will momentarily flash on the CHANNEL display. Tape play will not function until the VCR is unlocked.

To unlock: Depress and hold the remote control's PLAY button for about 4 seconds.

Even if the POWER is turned off, the VCR will remain locked until released.

III. PRINCIPAL PARTS LOCATION

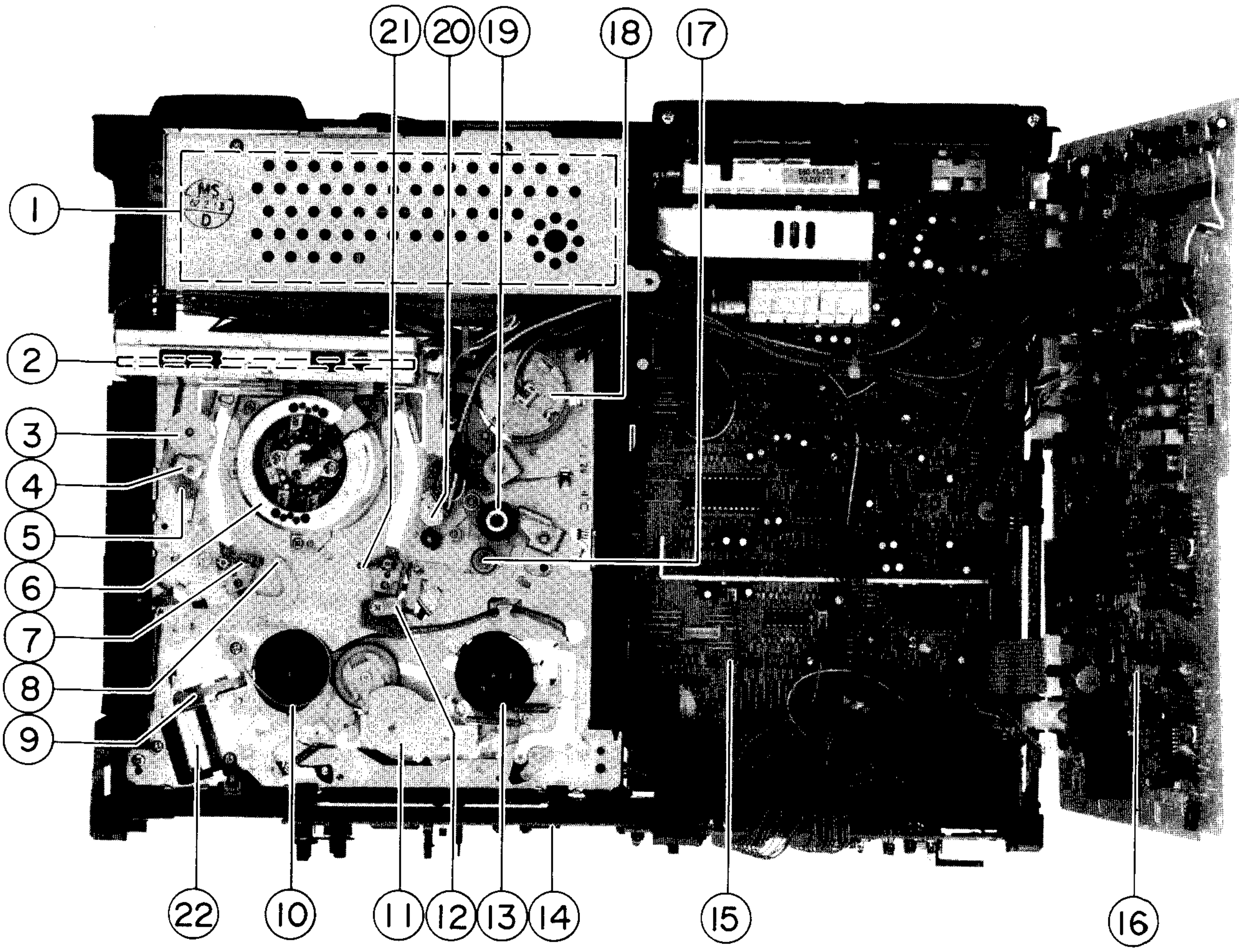


Fig. 3-1 Top View

1. SW POWER PC BOARD
2. PRE AMP PC BOARD
3. IMPEDANCE ROLLER
4. FULL TRACK ERASE HEAD
5. SUPPLY TAPE GUIDE
6. HEAD DRUM BLOCK
7. LOADING LEADER (L)
8. TENSION ARM
9. SYNCHRO BELT
10. SUPPLY REEL TABLE
11. TAKE UP GEAR BLOCK
12. SENSOR LED
13. TAKE UP REEL TABLE
14. OPERATION PC BOARD
15. MAIN PC BOARD
16. VIDEO PC BOARD
17. CAPSTAN SHAFT
18. CAPSTAN MOTOR
19. PINCH ROLLER
20. AUDIO/CONTROL HEAD
21. LOADING LEADER (R)
22. LOADING MOTOR

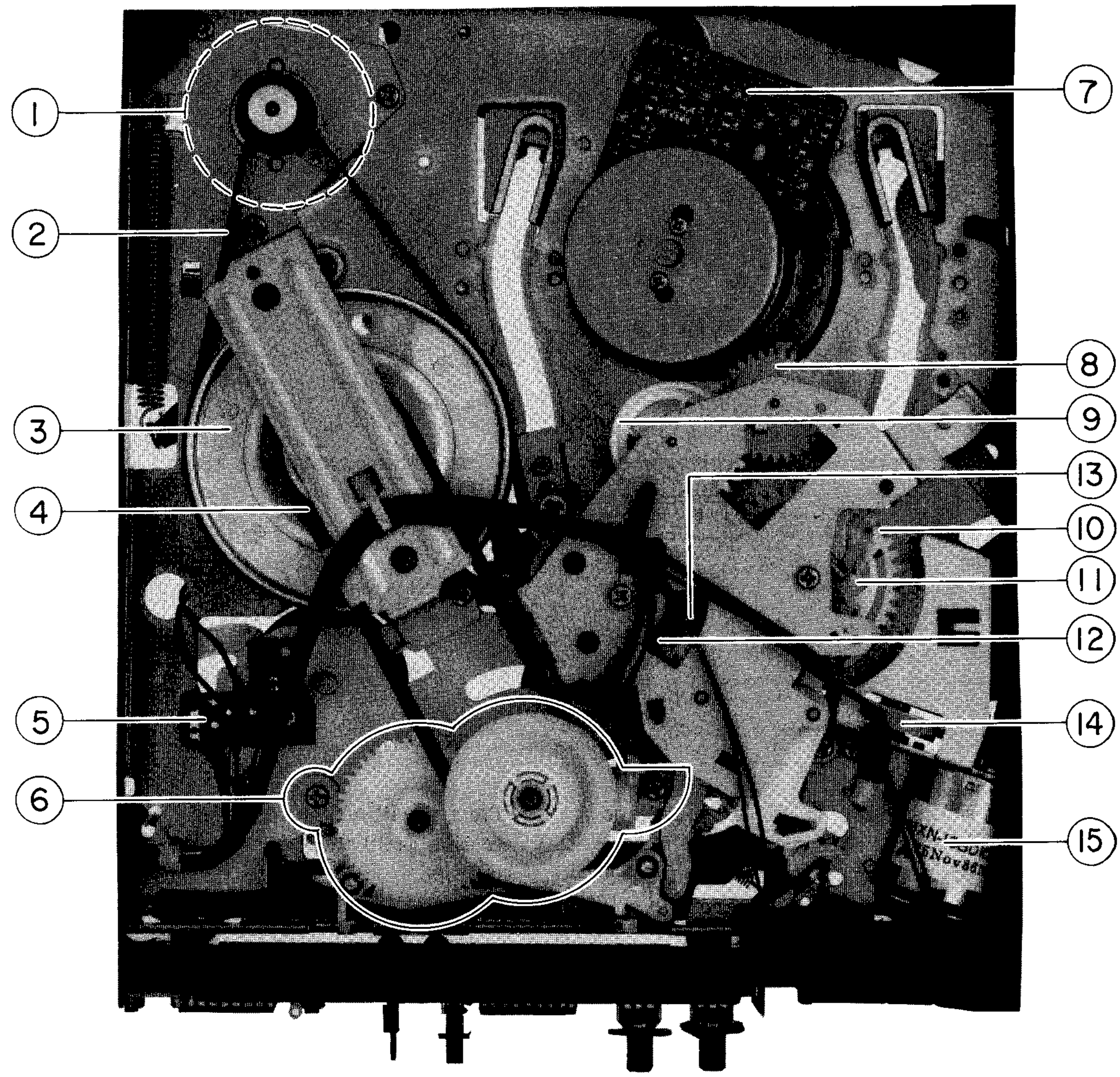


Fig. 3-2 Bottom View

1. CAPSTAN MOTOR
2. CAPSTAN BELT
3. CAPSTAN FLYWHEEL
4. IDLER BELT
5. REEL SENSOR PCB
6. TAKE-UP GEAR BLOCK
7. DRUM MOTOR BLOCK
8. SUPPLY LOADING GEAR
9. TAKE-UP LOADING GEAR
10. EJECT CAM GEAR
11. EJECT SWITCH
12. ROTARY ENCORDER
13. MAIN GEAR CAM
14. SYNCHRO BELT
15. LOADING MOTOR

IV. MECHANICAL ADJUSTMENT

4-1. BACK TENSION ADJUSTMENT

1) Remove the EJECTOR BLOCK and disconnect P110 from the Main PCB.

2) Depress the POWER button on the Front Panel.

3) Set the unit to tape loaded mode with short pin ③ and pin ⑤ of P110 as example shown in Fig. 4-1.

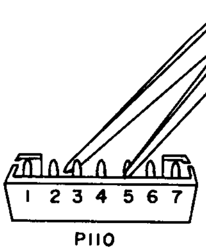

1 2 3 4 5 6 7
P110

Fig. 4-1

4) Set the Back Tension jig (AT-751181) and put some weight on the Back Tension jig as a stabilizer.

5) Press the PLAY button, then check and adjust back tension as 30 ~ 35 g-cm by the TENSION HOLDER ppsition.

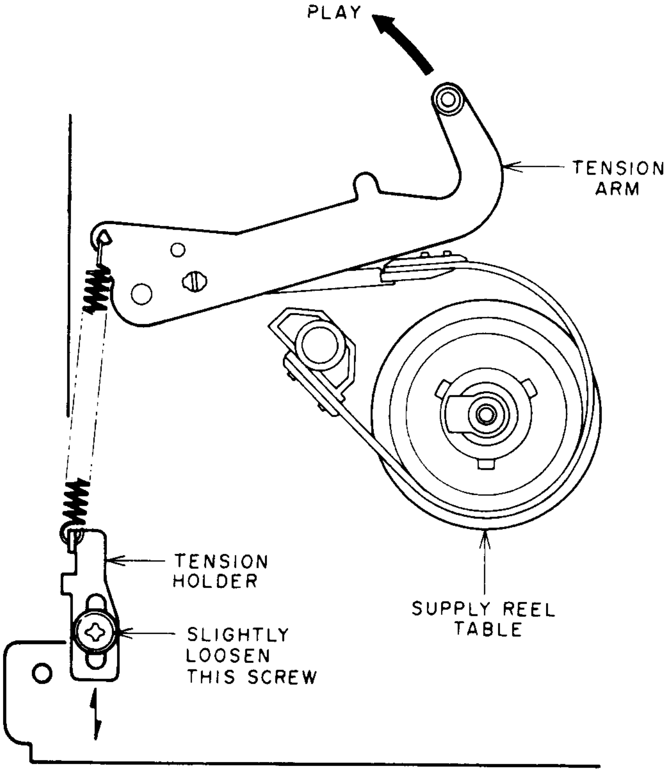
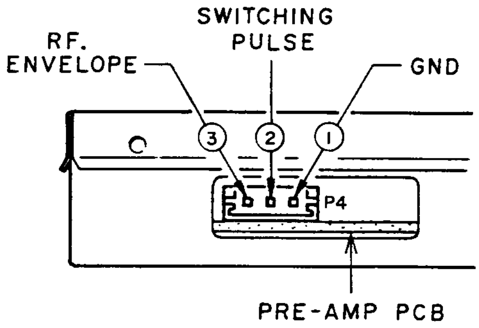

PLAY
TENSION ARM
TENSION HOLDER
SLIGHTLY LOOSEN THIS SCREW
SUPPLY REEL TABLE

Fig. 4-2

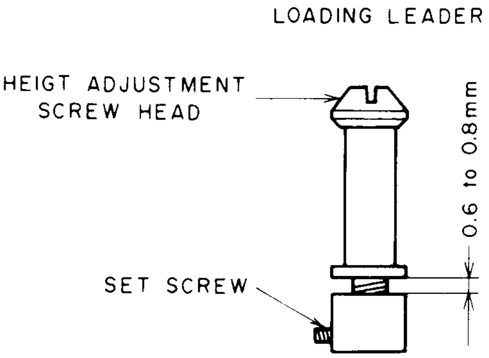
4-2. LOADING LEADER HEIGHT ADJUSTMENT

1) Slight loosen the set screw at the lower part of the LOADING LEADER so that the LOADING LEADER can be adjusted with reasonable tightness. Adjust the coarse height of the LOADING LEADER from the base mount as 0.6 to 0.8 mm.
2) Set the reference tape AT-751775 (TF-530RFS) and depress the PLAY button.
3) Connect the Oscilloscope to pin ③ RF ENVELOPE test terminal of connector P4 on the PRE-AMP P.C. BOARD and turn the LOADING LEADER height adjustment screw heads to obtain the flat envelope as Fig. 4-5 ideal envelope.
4) After the adjustments, tighten the LOADING LEADER set screw.



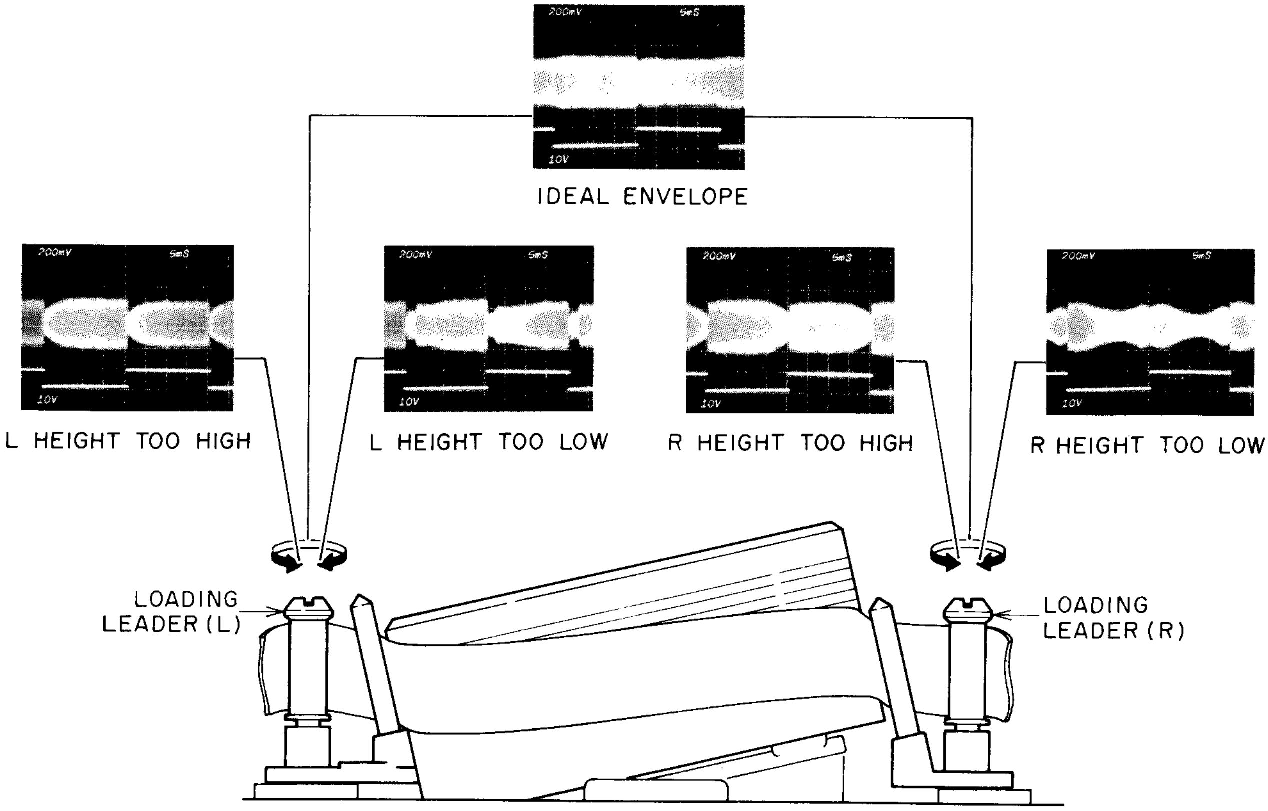
RF.
ENVELOPE
SWITCHING
PULSE
GND
③
②
①
P4
PRE-AMP PCB

Fig. 4-3



LOADING LEADER
HEIGT ADJUSTMENT
SCREW HEAD
SET SCREW
0.6 to 0.8mm

Fig. 4-4



200mV
5mS
10V
IDEAL ENVELOPE
L HEIGHT TOO HIGH
L HEIGHT TOO LOW
R HEIGHT TOO HIGH
R HEIGHT TOO LOW
LOADING
LEADER (L)
LOADING
LEADER (R)

Fig. 4-5

4-3. TAPE CURL AT TAKE-UP TAPE GUIDE ADJUSTMENT

Turn the screw ⓐ on the A/C HEAD BLK so that the down edge of the tape touches the TAKE-UP TAPE GUIDE lower part without any curl or waving.

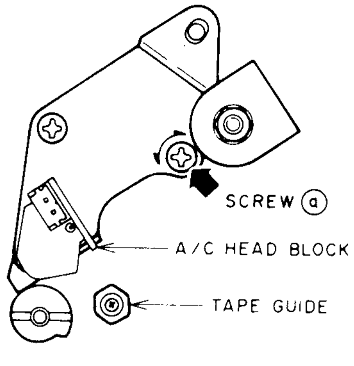
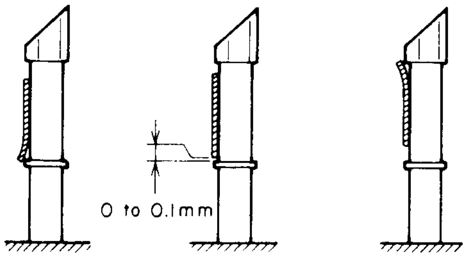

SCREW ⓐ
A/C HEAD BLOCK
TAPE GUIDE

Fig. 4-6



(a) NO GOOD (b) GOOD (c) NO GOOD

Fig. 4-7

4-4. AUDIO HEAD AZIMUTH ADJUSTMENT

1) Turn the NUT ⓐ for coarse A/C HEAD BLOCK height adjustment as in Fig. 4-7, 8.

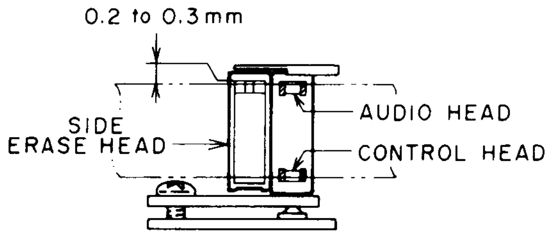

0.2 to 0.3mm
SIDE ERASE HEAD
AUDIO HEAD
CONTROL HEAD

Fig. 4-8

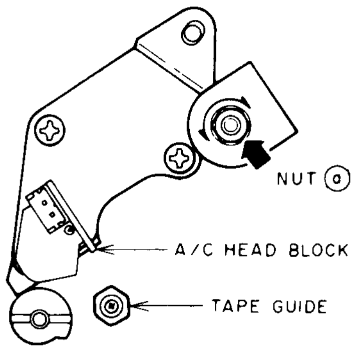

NUT ⓐ
A/C HEAD BLOCK
TAPE GUIDE

Fig. 4-9

2) Connect an oscilloscope or AC voltmeter to the AUDIO LINE OUT.
3) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
4) Turn the screw ⓑ to obtain the maximum audio signal output.

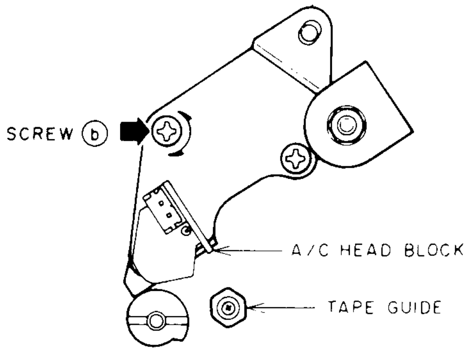

SCREW ⓑ
A/C HEAD BLOCK
TAPE GUIDE

Fig. 4-10

4-5. RF ENVELOPE ADJUSTMENT

1) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
2) Slightly turn the LOADING LEADER HEIGHT ADJUSTMENT SCREW HEAD (L) (R) to obtain the IDEAL ENVELOPE as shown in Fig. 4-5.

4-6. TAPE CURL AT SUPPLY TAPE GUIDE ADJUSTMENT

1) Check the tape curl at Supply Tape Guide slightly turn the NUT ⓐ if the tape curl exists.

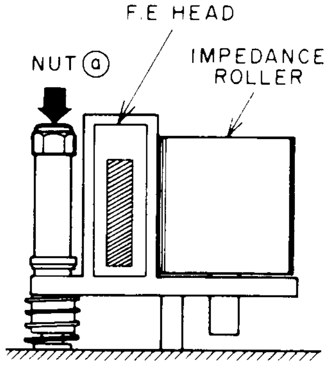
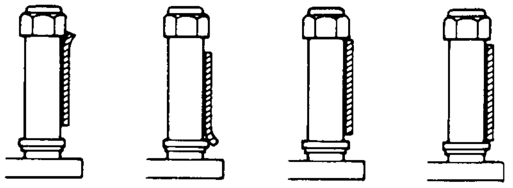

F.E HEAD
NUT ⓐ
IMPEDANCE ROLLER

Fig. 4-11



NO GOOD GOOD

Fig. 4-12

4-7. AUDIO HEAD HEIGHT ADJUSTMENT

1) Connect an oscilloscope or a AC Voltmeter to the LINE AUDIO OUT.
2) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
3) Slightly turn the NUT ⓐ shown in Fig. 4-9 to obtain the maximum aduio output.

4-8. CONTROL HEAD POSITION ADJUSTMENT

1) Connect an oscilloscope to TP1 RF ENVELOPE test terminal on the MAIN (VIDEO) PC Board.
2) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
3) Set the Tracking Control Volume to center click position.
4) Adjust Mechanical Tracking Adjustment Screw ⓐ to obtain the maximum RF ENVELOPE.

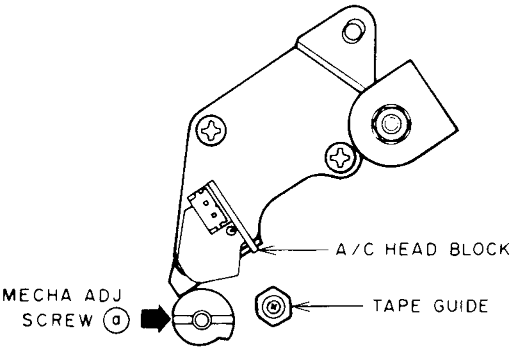

A/C HEAD BLOCK
MECHA ADJ SCREW ⓐ
TAPE GUIDE

Fig. 4-13

4-9. CUE REVIEW ADJUSTMENT

1) Set a E-180 tape, press the PLAY and the F.FWD button (CUE mode).
2) Turn the CUE/REVIEW GUIDE height adjustment Nut ⓒ so that the wrinkle between the PINCH ROLLER and the CUE/REVIEW GUIDE are not existed.
3) Depress the REV button (REVIEW mode) confirm the curl at the tape down edge is not existed at the TAPE GUIDE as shown in Fig. 4-7.
   Fig. 4-7 (c) is not acceptable, but Fig. 4-7 (b) is acceptable).

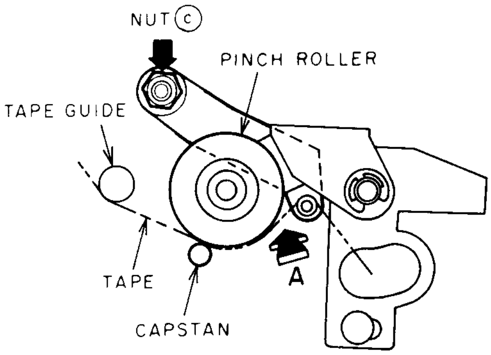

NUT ⓒ
PINCH ROLLER
TAPE GUIDE
TAPE
A
CAPSTAN

Fig. 4-14

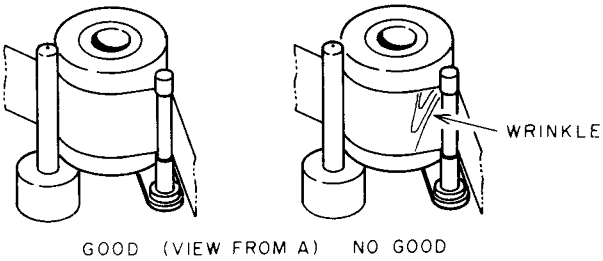

WRINKLE
GOOD (VIEW FROM A)
NO GOOD

Fig. 4-15

V. HEAD DRUM REPLACEMENT

5-1. REPLACEMENT PROCEDURE

1) Remove the Drum Earth SP Assy.
2) Remove the two Upper Drum fixing screws.
3) Unsolder the eight wires from the Rotary Transformer.
   (SP-1: WHITE, SP-2: RED, LP-1: YELLOW, LP-2: BLACK)
4) Install the Upper Drum (HEAD DRUM).
5) Tighten the two Upper Drum fixing screws.
6) Resorder the eight wires as follows.

SP-1 (WHITE)	short white to "Y". long white to "W".
SP-2 (RED)	short red to "Y". long red to "BL".
LP-1 (YELLOW)	short yellow to "BU". long yellow to "BR".
LP-2 (BLACK)	short black to "BU". long black to "R".

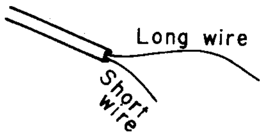

Long wire
Short wire

Fig. 5-1

7) Install the DRUM EARTH SP ASSY.

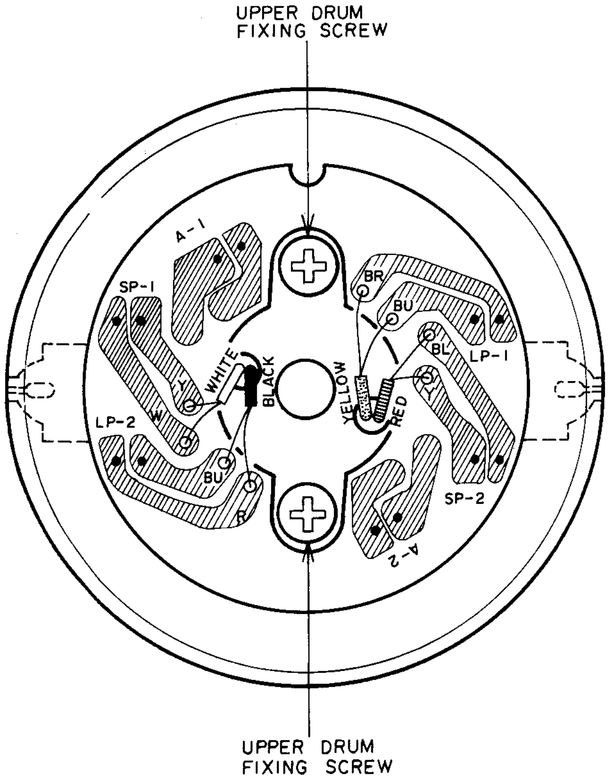

UPPER DRUM FIXING SCREW
A-1
SP-1
LP-2
Y
W
WHITE
BLACK
BU
R
BR
BU
BL
LP-1
YELLOW
RED
Y
SP-2
A-2
UPPER DRUM FIXING SCREW

Fig. 5-2

NOTE: For the proper performance, height precisior is required for the relative height of video heads, and the head tips are fragile, the following points should be noted when replacing the Upper Drum Block.

(a) Do not loosen the set screw on the collor preload.
(b) Before not loosen the set screw on the collar preload.
(b) Before fixing, clean both surfaces where the upper drum and the rotary transformer part meet with alcohol.
(c) When installation of upper drum, if it does not go on to the shaft easily, clean the hole in the upper drum with alcohol and put a little oil on the shaft.
(d) Make sure that the upper drum fixing screw holes on the rotary transformer part and the upper drum fixing screw penetration holes match exactly before inserting the fixing screws.
(e) Tighten the two upper drum fixing screws alternately and gradually. Tighten them at 6 kg-cm torque.

5-2. AFTER REPLACEMENT

After replacement, the following adjustments and confirmations are necessary for the proper performance.

1) Tracking preset adjustment. (Servo adjustment Step 1).
2) PB switching point adjustment. (Servo adjustment Step 2, 3, 4).
3) REC current adjustment. (Video adjustment Step 6, 7, 8, 9).

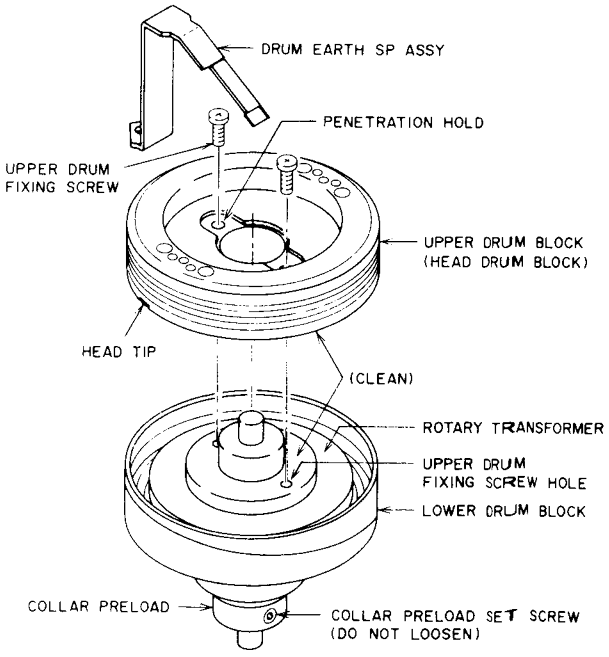

DRUM EARTH SP ASSY
PENETRATION HOLD
UPPER DRUM FIXING SCREW
UPPER DRUM BLOCK (HEAD DRUM BLOCK)
HEAD TIP
(CLEAN)
ROTARY TRANSFORMER
UPPER DRUM FIXING SCREW HOLE
LOWER DRUM BLOCK
COLLAR PRELOAD
COLLAR PRELOAD SET SCREW (DO NOT LOOSEN)

Fig. 5-3

VI. HOW TO MOUNT THE ROTARY PLATE

When mounting the rotary plate on the drum motor, be sure to align the mark (Small round hole) on the rotary plate (a) with the collar preload set screw (d) on the collar preload (c) as illustrated above.

NOTE: Do not attempt to remove the collar preload (c) on the head assy. If removed, a special jig is needed for reinstallation, which almost always requires replacement of the drum assy.

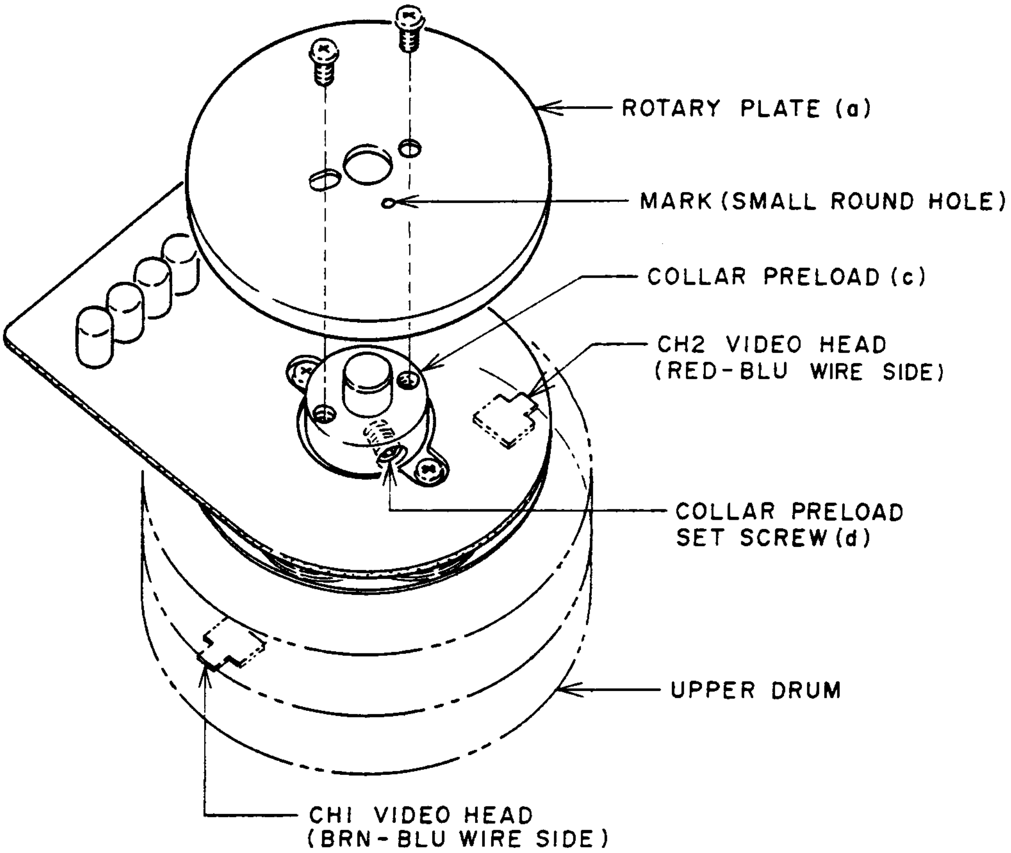

ROTARY PLATE (a)
MARK (SMALL ROUND HOLE)
COLLAR PRELOAD (c)
CH2 VIDEO HEAD (RED-BLU WIRE SIDE)
COLLAR PRELOAD SET SCREW (d)
UPPER DRUM
CH1 VIDEO HEAD (BRN-BLU WIRE SIDE)

Fig. 6-1 How to Mount the Rotary Plate

VII. HOW TO ASSEMBLE LOADING MECHANISM

1) With the unit unloaded, attach Gear Loading (S) BLK and Gear Loading (T) BLK to Mecha chassis so that align the mark.

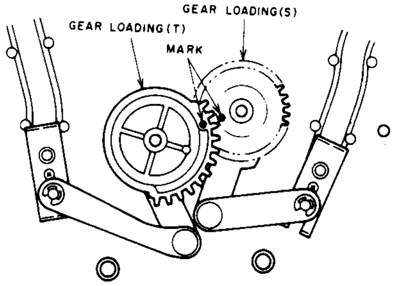

GEAR LOADING(S)
GEAR LOADING(T)
MARK

Fig. 7-1

2) Attach Gear Cam Eject to Mecha chassis so that align the marks.

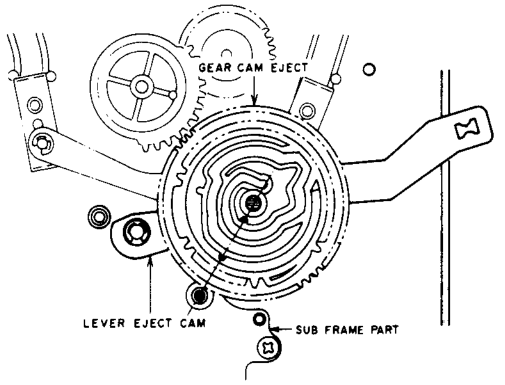

GEAR CAM EJECT
LEVER EJECT CAM
SUB FRAME PART

Fig. 7-2

3) Attach Gear Cam Main to Mecha chassis so that Pin Ⓐ of Lever P Cam and Pin Ⓑ of Lever Cam Slide mate oval hole of Gear Cam Main.

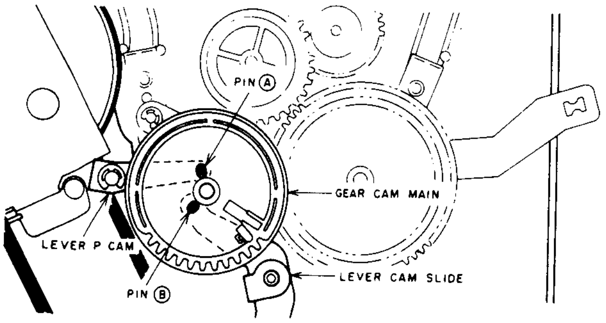

PIN Ⓐ
GEAR CAM MAIN
LEVER P CAM
PIN Ⓑ
LEVER CAM SLIDE

Fig. 7-3

4) Attach Lever Cam Tension to Mecha chassis so that Pin Ⓐ goes into valley of Gear Cam Eject.

5) Attach Lever Cam F/R to Mecha chassis so that Pin Ⓑ goes into valley of Gear Cam Eject. and Pin Ⓒ of Plate F/R Slide (2) Part into hole of lever Cam F/R.

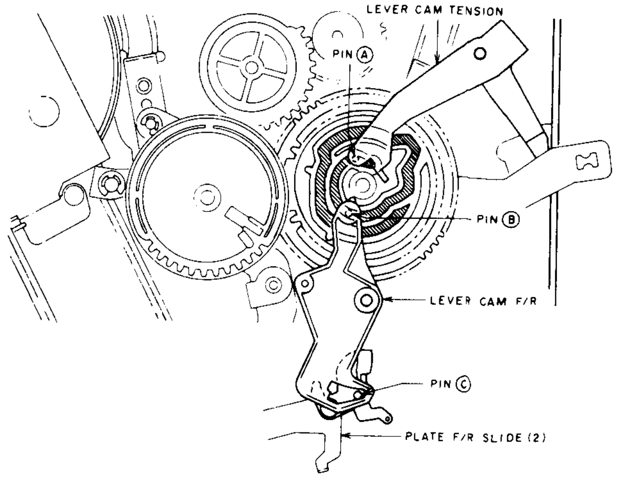

LEVER CAM TENSION
PIN Ⓐ
PIN Ⓑ
LEVER CAM F/R
PIN Ⓒ
PLATE F/R SLIDE (2)

Fig. 7-4

6) Attach Arm Set Free onto Lever Cam Slide.

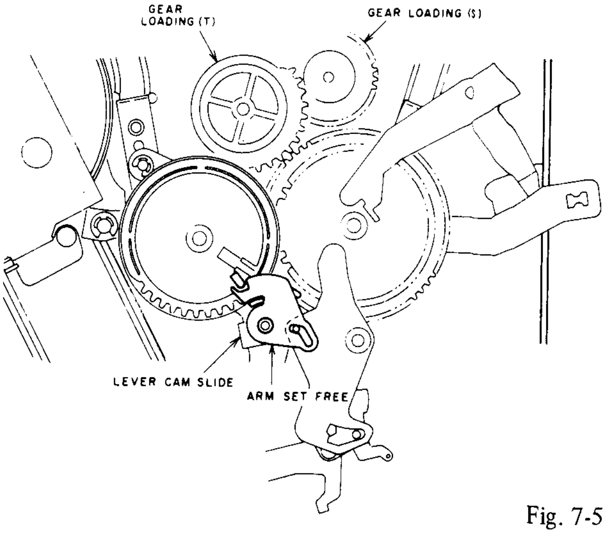

GEAR LOADING (T)
GEAR LOADING (S)
LEVER CAM SLIDE
ARM SET FREE

Fig. 7-5

7) Attach Mode SW BLK to Mecha chassis so that the latch of Rotary Encoder goes into slit Ⓐ of Gear Cam Main and tighten with screw Ⓑ

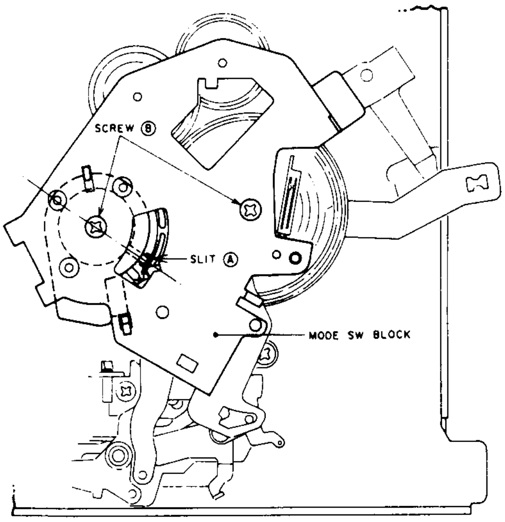

SCREW Ⓑ
SLIT Ⓐ
MODE SW BLOCK

Fig. 7-6

8) Mount Loading Motor BLK and tighten with screw Ⓐ

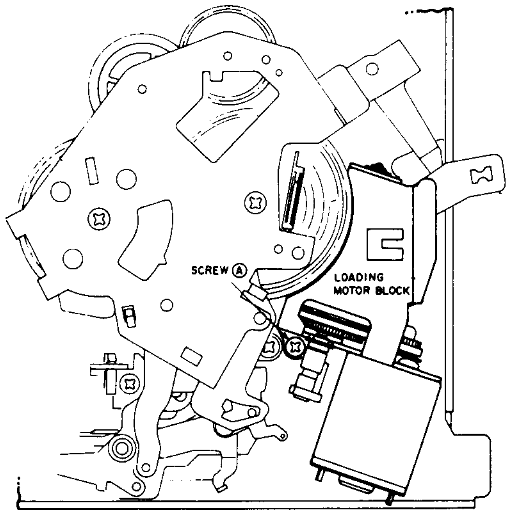

SCREW Ⓐ
LOADING MOTOR BLOCK

Fig. 7-7

VIII. EXPLANATION OF POWER SUPPLY CIRCUIT

8-1. OVER VIEW

A switching regulated power supply has been employed for the VS-X9, that is an RCC (Ringing Choke Converter) type. The arrangement has enabled the VS-X9 to operate at a broad range of mains power voltages (110V AC to 240V AC) without any voltage switching requirements.

After the direct rectification and smoothing of mains power, the voltage serves as the switching regulator power input. Pulses generated by the switching regulator induce power in the secondary coils of power transformer T1, and after being duly rectified, the voltage of these coils will individually be output as a DC voltage. In addition, the secondary voltage will also be fed back through a photo-coupler to the switching regulator. By detecting the secondary voltage fluctuations due to fluctuations in the mains power and load, and regulating the magnitude of switching pulses with the detected output, the feedback arrangement holds the output voltage at a steady level. See Fig. 8-1.

Thermistor TH1 in the circuit diagram serves to prevent the breakdown of D1 or blowing of the fuse caused by an inrush current in a C3 charging mode.

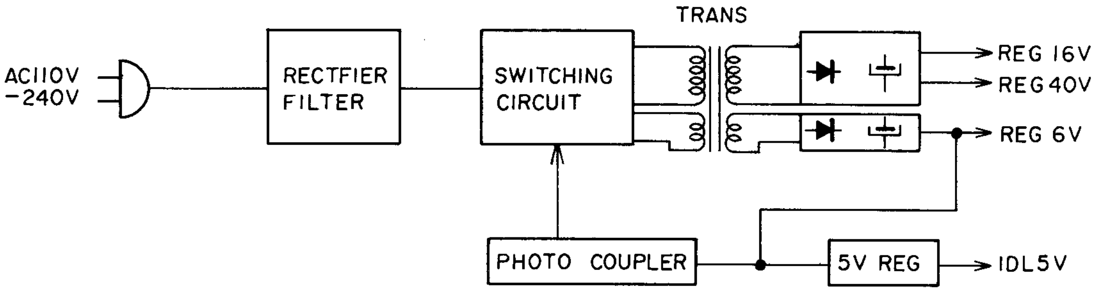


Fig. 8-1

8-2. OSCILLATING PRINCIPLES

1) TR1: ON MODE

Initially, start-up current "is" flows through R1 and R3 to the TR1 base. It causes collector current "ic" to flow through TR1. See Fig. 8-2.

The current will be a temporally linear current that may be expressed by "$ic = \frac{V}{LP}t$". See Fig. 8-3.

By assuming a negligibly small coil Lp resistance and an equally infinitesimal internal resistance of TR1 in its on mode, the relationship: "$ic \fallingdotseq \frac{V}{Lp}t$" may actually be held valid.

The flowing of current "ic" through coil Lp causes a voltage with the polarity illustrated to be generated in coil Lb. See Fig. 8-2.

By denoting the mutual inductance between Lp and Lb with Mpb, voltage "vb" in coil Lb may be expressed by:

$$vb = Mpb\,\frac{dic}{dt} = Mpb\,\frac{d}{dt}\left(\frac{V}{Lp}t\right) = \frac{Mpb}{Lp}V$$

which is a steady level irrespectivel of time.

Due to the steady "vb" level, base current "ib" of TR1 will also be made steady in level, as follows:

$$ib = (vb - VD3 - VBE)/R3 \fallingdotseq vb/R3 \quad (is \ll ib)$$

$$= \frac{Mpb}{Lp}V/R3$$

See Fig. 8-3.

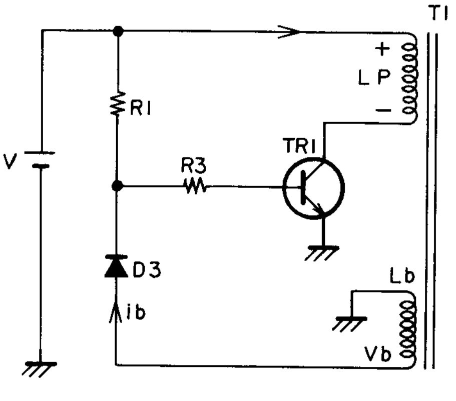


Fig. 8-2

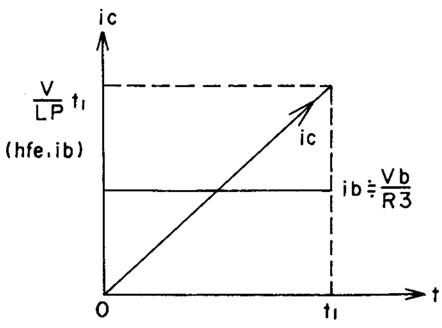


Fig. 8-3

Until t = t1 is reached, "ic" climbs up proportionally to the passage of time under the influence of "ib", but since "ic" cannot exceed hFE.ib in level, Vb as well as "ib" will drop down to a zero level at the point in time t1 when the linearity of "ic" is lost. At that time, since ib = 0, "ic" will also drop down to a zero level, and TR1 will turn off.

During the interval in which TR1 remains on (t0 to t1), no current flows through the secondary coil of transformer T1 due to the reverse biased D8. See Fig. 8-4.

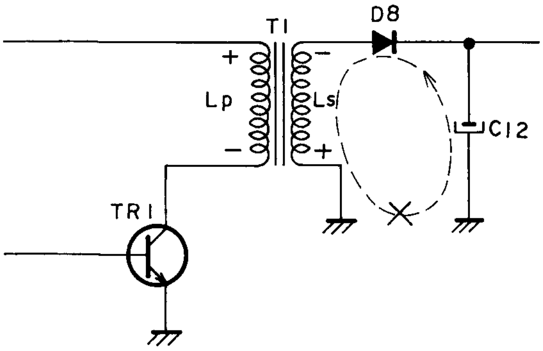


Fig. 8-4

2) TR1: OFF MODE

Because TR1 sharply turns off at t1, a voltage with the illustrated polarity will then be induced in coil Lp. See Fig. 8-5.

Collector voltage VCE of TR1 at that time will be:

VCE = V + Vp

Meanwhile, for overvoltage preventive purposes, TR1 has been provided with a snubber (composed of D5, R4, and C7). See Fig. 8-6.

In secondary coil Ls of transformer T1, a voltage with the illustrated polarity will be generated to flow current "is" through Ls. See Fig. 8-5.

vs = Vout + VD8 ≒ Vout

The "is" waveform will slope down rightward. See Fig. 8-7.

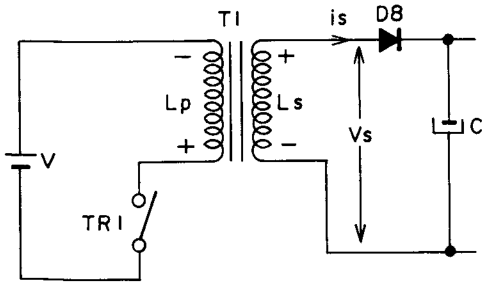


Fig. 8-5

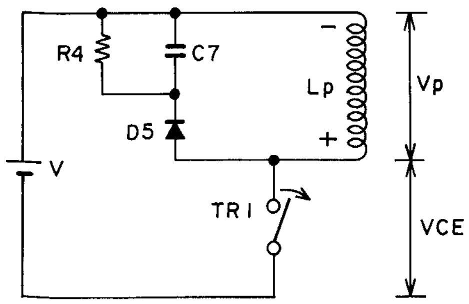


Fig. 8-6

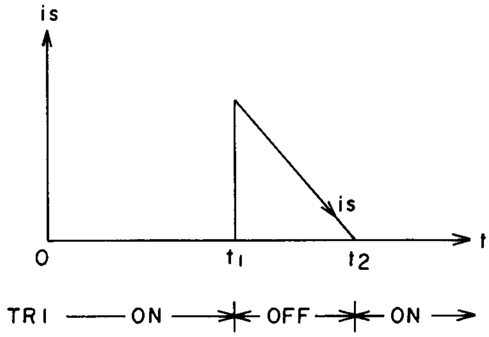


Fig. 8-7

During the interval in which TR1 remains off, voltage "vb" is generated in coil Lb and its magnitude proportional to the current "is" slope (i.e. vb = Mbs $\frac{di}{dt}$). Current "ib" will be flown by "vb" to charge capacitor C6. See Fig. 8-8.

At t = t2, since "is" drops down to a zero level (Fig. 8-7), voltage "vb" will also drop down to zero. Then, as soon as vb = 0 is reached, C6 will begin to be discharged. See Fig. 8-9.

The discharge current will again flow a base current through TR1 which will therefore turn on.

The cyclic repetition of the above steps sustains an oscillatory behavior of the circuit.

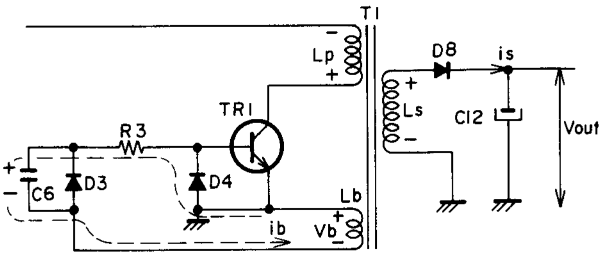


Fig. 8-8

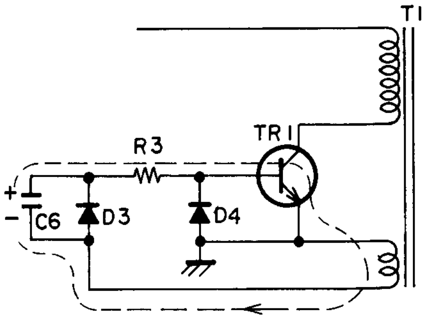


Fig. 8-9

8-3. OUTPUT REGULATION

The output voltage regulator serves to hold Vout, the voltage output of coil Ls of transformer T1, at a steady level.

Since the voltage across diode D6 is held steadily at 5V, the TR4 base voltage will be held at about 5.7V.

As voltage Vout climbs up, the TR4 base voltage will also rise. (vb ≒ Vout $\frac{R8}{R8+R9}$) In consequence, the TR4 collector current, IC, will be increased, and the photocoupler PH-1 current also will similarly be increased. The PH1 collector current will therefore be increased as well, and ultimately, the TR2 emitter current will similarly be increased.

For the above reason, current "ib" which flows from coil Ls into the TR1 base will be reduced by the shunting effect of TR2, and the TR1 collector current as well the voltage across coil Ls will also be reduced.

As Vout drops down, a reverse phenomenon to the above takes place, where the TR2 emitter current is reduced to increase the TR1 base current. See Fig. 8-10.

The negative voltage similarly generated by utilizing the pulses that have been generated at the turning off of TR1 will also vary in level in accordance with the TR1 collector current, and contributes to the voltage regulation. See Fig. 8-11.

Capacitors C4 and C20 connected together in series have been arranged as a safety measure in case one of them happens to break down and get shorted.

C7 at 220 μF prevents an inrush current to TR1 at the switch-on of AC power, and serves soft start-up purposes.

When testing the power supply circuit, be sure to connect a dummy resistor on at the Reg 6V Out terminal, and under no circumstances should it be tested at no load. (Dummy Resistor: 20Ω, 2W)

The circuit generated frequency ranges:

from 20kHz (for a heavy load or at a low AC voltage)
to 200kHz (for a light load or at a high AC voltage)

The primary and secondary circuit grounds have been isolated from each other, so that due caution will be required especially when testing the primary circuit.

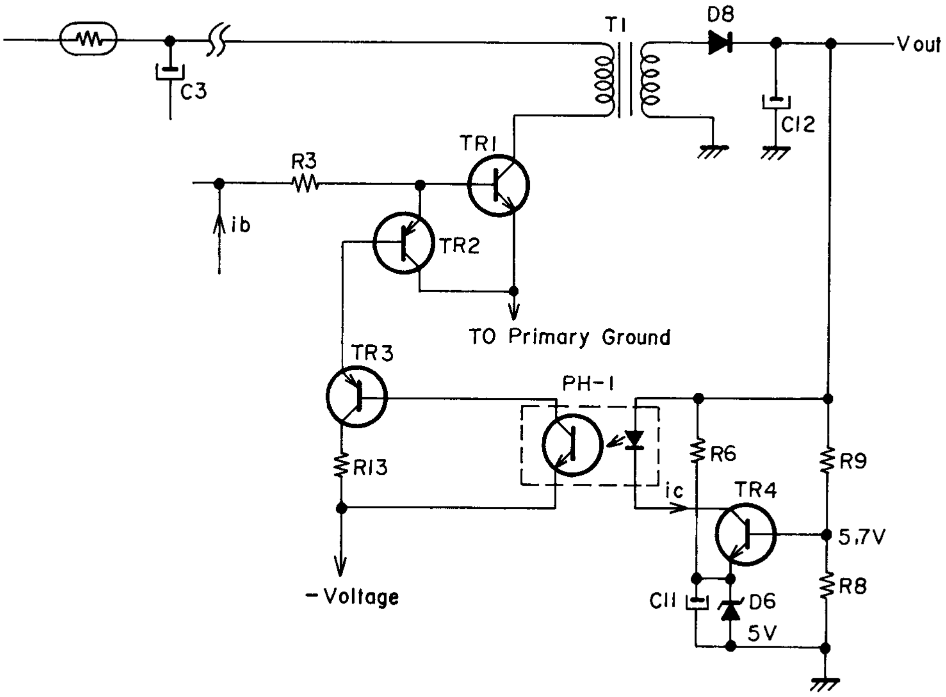


Fig. 8-10

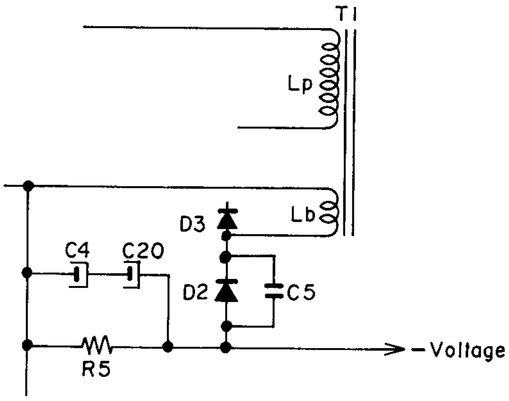


Fig. 8-11

IX. ELECTRICAL ADJUSTMENT

9-1. MAIN PCB ADJUSTMENT

Precautionary items prior to adjustments

1. The color bar generator output should be 1.0 Vp-p.
2. Video output terminal should be terminated with 75 ohms (dummy or load).

STEP ADJUSTMENT ITEM

1. Test mode/System mode and Input Signal/Test tape.
2. Test point and Adjust part.
3. Result and Remarks.

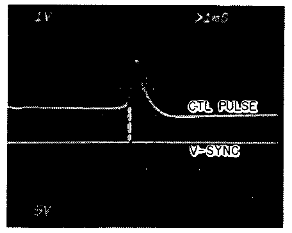
Adjust Part →

Test Point →

SERVO ADJUSTMENT

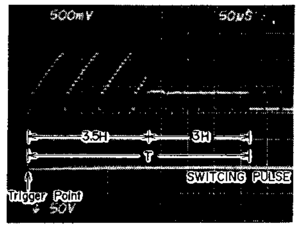
1 TRACKING PRESET

1. "PB" test tape TF-530RFS (TF-508RF) on the "PAL B/G" mode.
2. Test terminal P102 Pin ② (CTL PULSE), pin ④ (V-SYNC) & VR4.
3. Set the TRACKING CONTROL on the front panel to center click position.
   - Adjust VR4 so that the phase at rasing part of CTL pulse and falling part of V-SYNC are lined up.



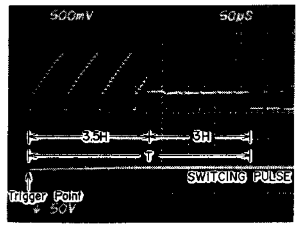
4 PAL PB SWITCHING POINT

1. "PB" test tape TF-530RFS (TF-508RF) on "PAL B/G" mode.
2. Test terminal P102 Pin ③ (SW PULSE) & VIDEO LINE OUT, VR3.
3. Adjust "T" to 6.5 ± 0.5H
   - Use the SWITCHING PULSE for trigger signal.



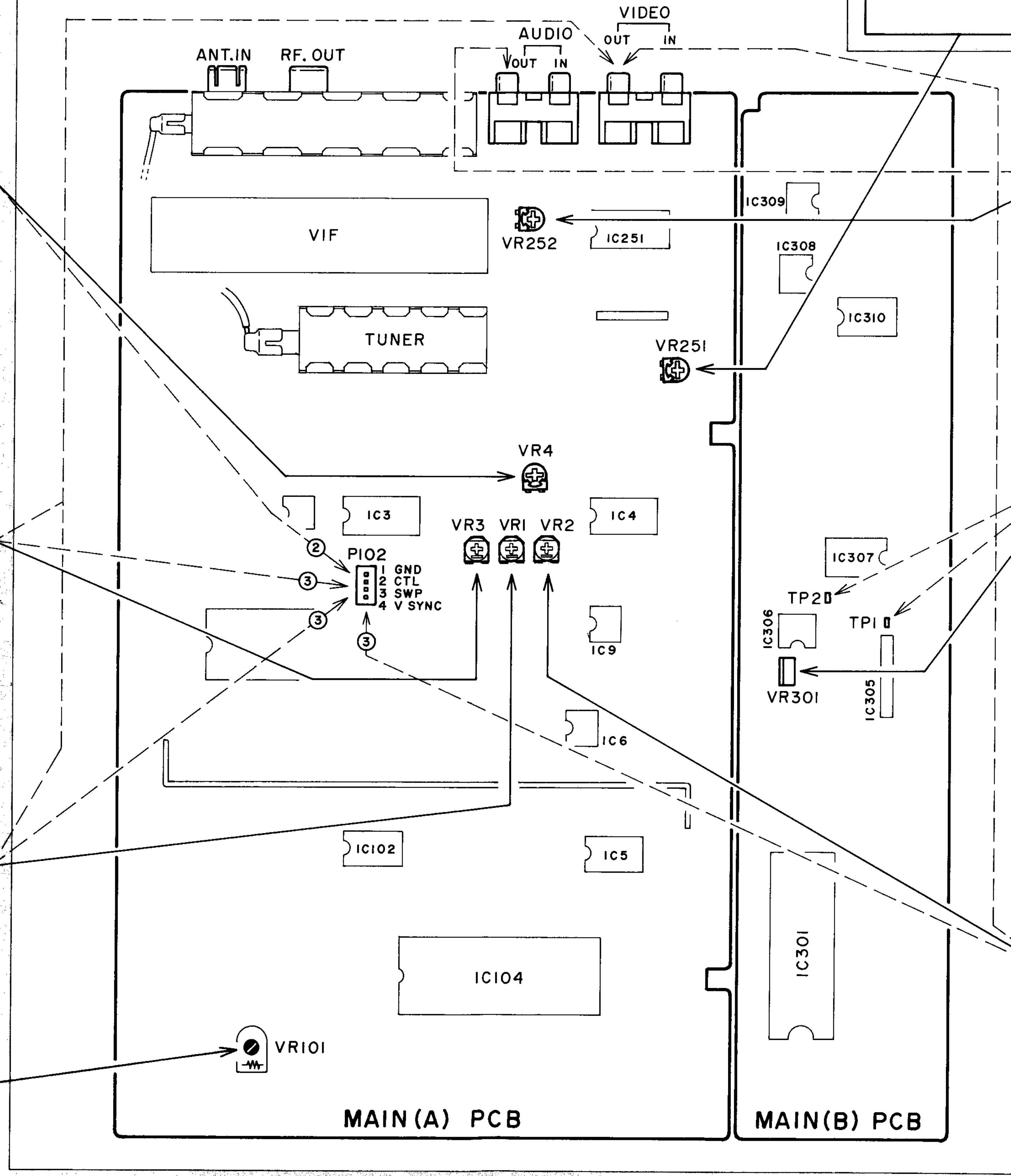
2 NTSC SLP PB SWITCHING POINT

1. "PB" test tape TF-522RF on the "NTSC 4.43" mode.
2. Test terminal P102 Pin ③ (SW. PULSE), VIDEO LINE OUT & VR1.
3. Adjust VR1 so that "T" become 6.5 ± 0.5H.
   - Use the SWITCHING PULSE for trigger signal.



5 VERTICAL STABILITY

1. "REC" TV program and "PB/PAUSE".
2. Monitor screen & VR101.
3. Minimum vibration of still picture.

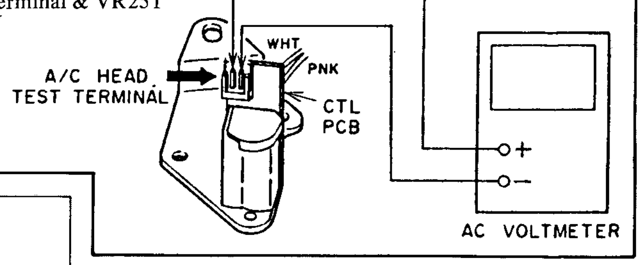


ANT.IN
RF. OUT
AUDIO
OUT IN
VIDEO
OUT IN
VIF
TUNER
VR252
IC251
VR251
IC309
IC308
IC310
VR4
IC3
IC4
VR3 VR1 VR2
P102
1 GND
2 CTL
3 SWP
4 V SYNC
②
③
③
③
IC9
IC6
IC102
IC5
IC104
VR101
IC307
TP2
TP1
IC306
VR301
IC305
IC301
MAIN (A) PCB
MAIN (B) PCB

AUDIO ADJUSTMENT

1 AUDIO REC BIAS

1. "REC" 1kHz –8dB audio signal on the "NTSC 3.58" mode.
2. A/C Head test terminal & VR251
3. 2.9mV ± 0.1mV



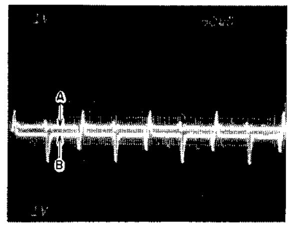
WHT
PNK
A/C HEAD TEST TERMINAL
CTL PCB
+
–
AC VOLTMETER

2 PAL AUDIO PB LEVEL

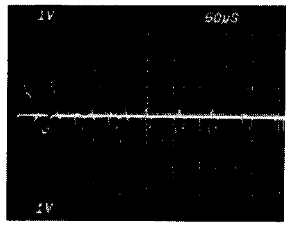
1. "PB" test tape TF-527BL (TF-513L)
2. Audio output & VR252
3. –3dBm ± 0.5dBm (TF-527BL)
   –9dBm ± 0.5dBm (TF-513L)

1 SYSTEM JUDGE AFC

1. PAL COLORBAR signal on the "STOP" and mode.
2. TP1, TP2 & VR301
3. Adjust VR301 so that DC voltage levels A and B are equal.



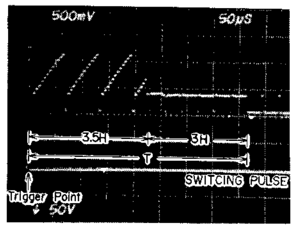
NO GOOD



GOOD

3 NTSC SP PB SWITCHING POINT

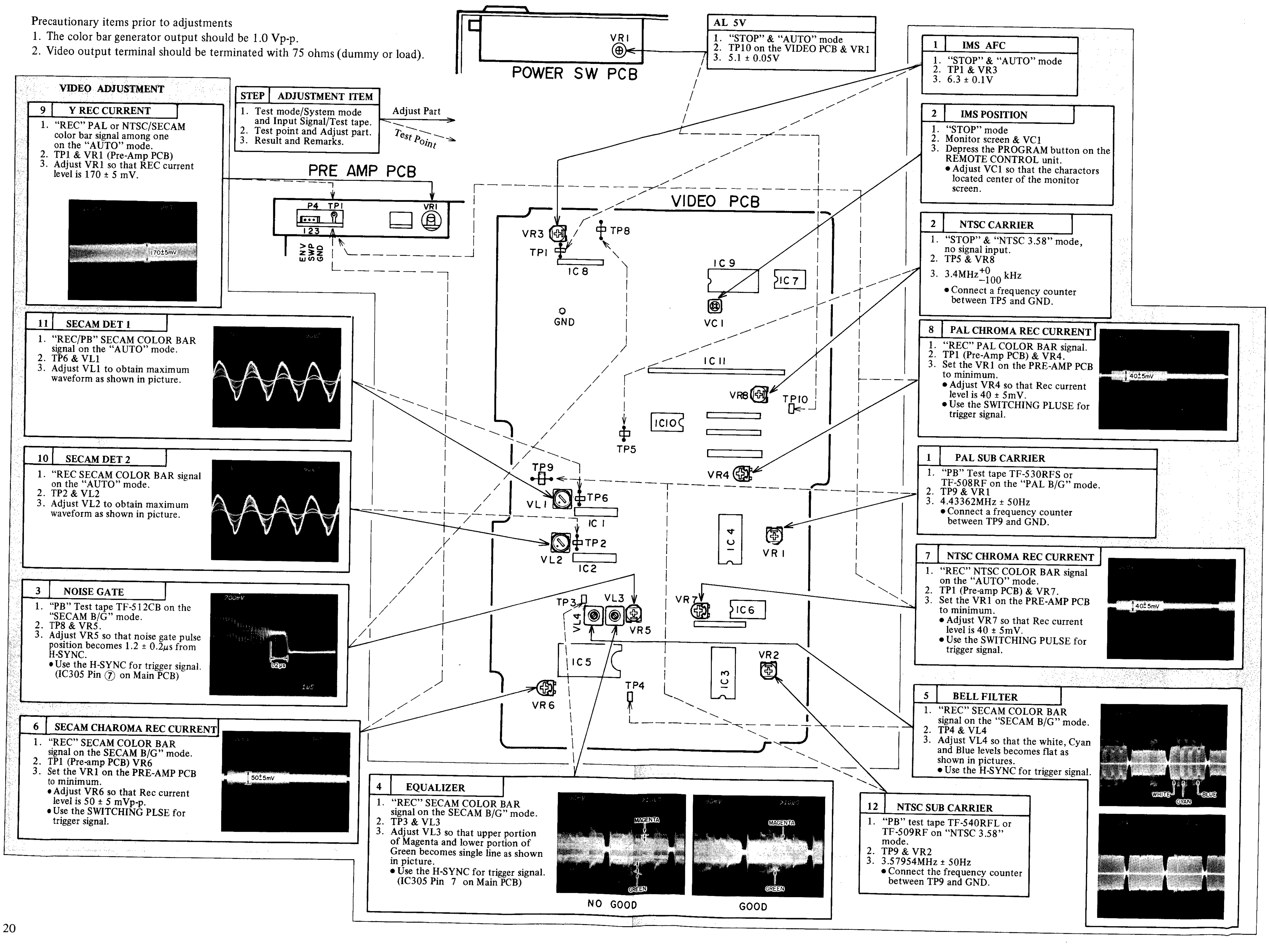
1. "PB" test tape TF-540RFS (TF-509RF) on the "3.58" mode.
2. Test terminal P102 Pin ③ (SW. PULSE), VIDEO LINE OUT & VR2.
3. Adjust VR2 so that "T" become 6.5 ± 0.5Hz.
   - Use the SWITCHING PULSE for trigger signal.



9-2. VIDEO PCB ADJUSTMENTS

Precautionary items prior to adjustments

1. The color bar generator output should be 1.0 Vp-p.
2. Video output terminal should be terminated with 75 ohms (dummy or load).



VIDEO ADJUSTMENT

STEP	ADJUSTMENT ITEM
	1. Test mode/System mode and Input Signal/Test tape. 2. Test point and Adjust part. 3. Result and Remarks.

Adjust Part →

Test Point →

9 | Y REC CURRENT

1. "REC" PAL or NTSC/SECAM color bar signal among one on the "AUTO" mode.
2. TP1 & VR1 (Pre-Amp PCB)
3. Adjust VR1 so that REC current level is 170 ± 5 mV.

11 | SECAM DET 1

1. "REC/PB" SECAM COLOR BAR signal on the "AUTO" mode.
2. TP6 & VL1
3. Adjust VL1 to obtain maximum waveform as shown in picture.

10 | SECAM DET 2

1. "REC SECAM COLOR BAR signal on the "AUTO" mode.
2. TP2 & VL2
3. Adjust VL2 to obtain maximum waveform as shown in picture.

3 | NOISE GATE

1. "PB" Test tape TF-512CB on the "SECAM B/G" mode.
2. TP8 & VR5.
3. Adjust VR5 so that noise gate pulse position becomes 1.2 ± 0.2μs from H-SYNC.
   - Use the H-SYNC for trigger signal. (IC305 Pin ⑦ on Main PCB)

6 | SECAM CHAROMA REC CURRENT

1. "REC" SECAM COLOR BAR signal on the SECAM B/G" mode.
2. TP1 (Pre-amp PCB) VR6
3. Set the VR1 on the PRE-AMP PCB to minimum.
   - Adjust VR6 so that Rec current level is 50 ± 5 mVp-p.
   - Use the SWITCHING PLSE for trigger signal.

4 | EQUALIZER

1. "REC" SECAM COLOR BAR signal on the SECAM B/G" mode.
2. TP3 & VL3
3. Adjust VL3 so that upper portion of Magenta and lower portion of Green becomes single line as shown in picture.
   - Use the H-SYNC for trigger signal. (IC305 Pin 7 on Main PCB)

NO GOOD

GOOD

AL 5V

1. "STOP" & "AUTO" mode
2. TP10 on the VIDEO PCB & VR1
3. 5.1 ± 0.05V

1 | IMS AFC

1. "STOP" & "AUTO" mode
2. TP1 & VR3
3. 6.3 ± 0.1V

2 | IMS POSITION

1. "STOP" mode
2. Monitor screen & VC1
3. Depress the PROGRAM button on the REMOTE CONTROL unit.
   - Adjust VC1 so that the charactors located center of the monitor screen.

2 | NTSC CARRIER

1. "STOP" & "NTSC 3.58" mode, no signal input.
2. TP5 & VR8
3. 3.4MHz$^{+0}_{-100}$ kHz
   - Connect a frequency counter between TP5 and GND.

8 | PAL CHROMA REC CURRENT

1. "REC" PAL COLOR BAR signal.
2. TP1 (Pre-Amp PCB) & VR4.
3. Set the VR1 on the PRE-AMP PCB to minimum.
   - Adjust VR4 so that Rec current level is 40 ± 5mV.
   - Use the SWITCHING PLUSE for trigger signal.

1 | PAL SUB CARRIER

1. "PB" Test tape TF-530RFS or TF-508RF on the "PAL B/G" mode.
2. TP9 & VR1
3. 4.43362MHz ± 50Hz
   - Connect a frequency counter between TP9 and GND.

7 | NTSC CHROMA REC CURRENT

1. "REC" NTSC COLOR BAR signal on the "AUTO" mode.
2. TP1 (Pre-amp PCB) & VR7.
3. Set the VR1 on the PRE-AMP PCB to minimum.
   - Adjust VR7 so that Rec current level is 40 ± 5mV.
   - Use the SWITCHING PULSE for trigger signal.

5 | BELL FILTER

1. "REC" SECAM COLOR BAR signal on the "SECAM B/G" mode.
2. TP4 & VL4
3. Adjust VL4 so that the white, Cyan and Blue levels becomes flat as shown in pictures.
   - Use the H-SYNC for trigger signal.

12 | NTSC SUB CARRIER

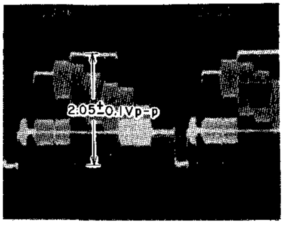
1. "PB" test tape TF-540RFL or TF-509RF on "NTSC 3.58" mode.
2. TP9 & VR2
3. 3.57954MHz ± 50Hz
   - Connect the frequency counter between TP9 and GND.

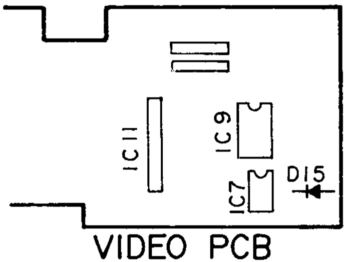
9-3. LUMINANCE SIGNAL PROCESSING IC11 (HH3201P) ADJUSTMENTS

NOTE: These adjustment's are generally unnecessary, except when replacing this IC.
Set the unit to PAL B/G mode by press the PAL B/G Button.

1 EE LEVEL

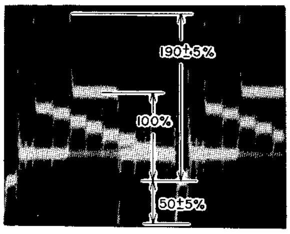
1. "E-E", Input PAL color bar signal.
2. Pin 10 of IC3215S & VR1.
3. 2.05 ± 0.1 Vp-p
   - Unsoldering one side of the diode D15.




IC11
IC9
IC7
D15
VIDEO PCB

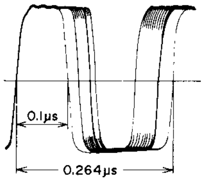
3 WHITE CLIP & DARK CLIP

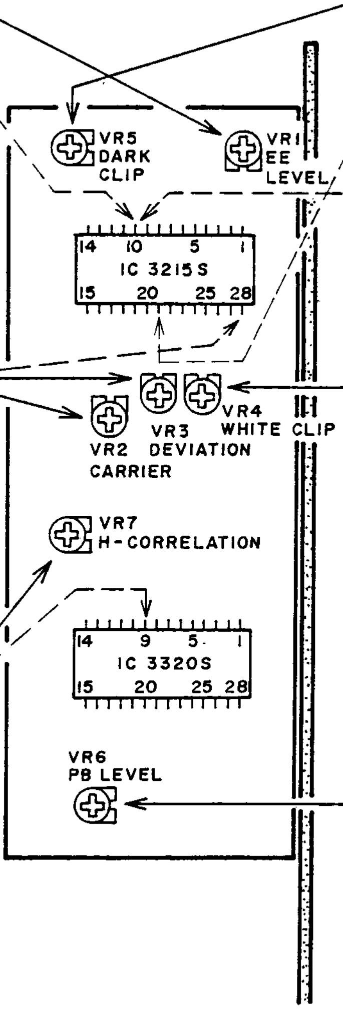
1. "REC" PAL color bar signal.
2. Pin 21 of IC3215S & VR4 (White clip), VR5 (Dark clip)
3. - VR4 (White clip) . . . 190 ± 5%
   - VR5 (Dark clip) . . . 50 ± 5%


190±5%
100%
50±5%

2 FM CARRIER & DEVIATION

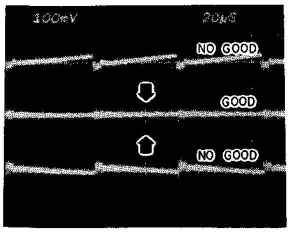
1. "REC", PAL color bar signal.
2. Pin 28 of IC3215S & VR2 (Carrier) VR3 (Deviation).
3. - VR2 (Carrier) 0.264μs (3.8MHz)
   - VR3 (Deviation) . . 0.1μs (1MHz)


0.1μs
0.264μs


VR5
DARK
CLIP
VR1
EE
LEVEL
14 10 5 1
IC 3215S
15 20 25 28
VR4
WHITE CLIP
VR3
DEVIATION
VR2
CARRIER
VR7
H-CORRELATION
14 9 5 1
IC 3320S
15 20 25 28
VR6
PB LEVEL

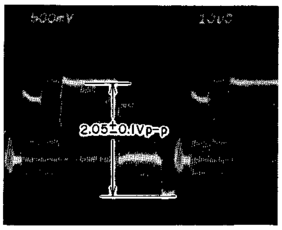
4 H-CORRELATION

1. "PB" Test tape TF-530RFS
2. Pin 9 of IC3320S & VR7
3. Adjust VR7 so that signal of pin 9 become flat.


100mV
20μS
NO GOOD
GOOD
NO GOOD

5 PB LEVEL

1. "REC/PB" PAL color bar signal.
2. Pin 10 of IC3215S & VR6.
3. 2.05 ± 0.1 Vp-p


500mV
2.05±0.1Vp-p

X. PARTS LIST

ATTENTION

1. **When placing an order for parts, be sure to list Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.**
2. **Please make sure that Part No. is correct when ordering. If not, a part different from the one you ordered may be delivered.**
3. **Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.**

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20×03STL CMT
2-4	ZS-536488	BID20×08STL CMT
2-5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

A small "x" indicates that this part is not shown in the Photo or Illustration.

This number corresponds with the individual parts index number in that figure.

This number corresponds with the Figure Number.

b) PC Board

6. MAIN PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
6-C1B	EC-350949	C MMY V 223M 250DC [J]
6-C1C	EC-338397	C MMY V 223M 125AC [C,A]
6-X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination

[A]: AAL(U.S.A.)
[S]: SAA(Australia)
[B]: BEAB(England)
[U]: U/T(Universal Area)
[C]: CSA(Canada)
[V]: VDE(W. Germany)
[E]: CEE(Europe)
[Y]: Custom Version
[J]: JPN(Japan)

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ (*) INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ (*) IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÉCES RECOMMANDEES PAR LÉ FABRICANT.

1. RECOMMENDED SPARE PARTS

We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

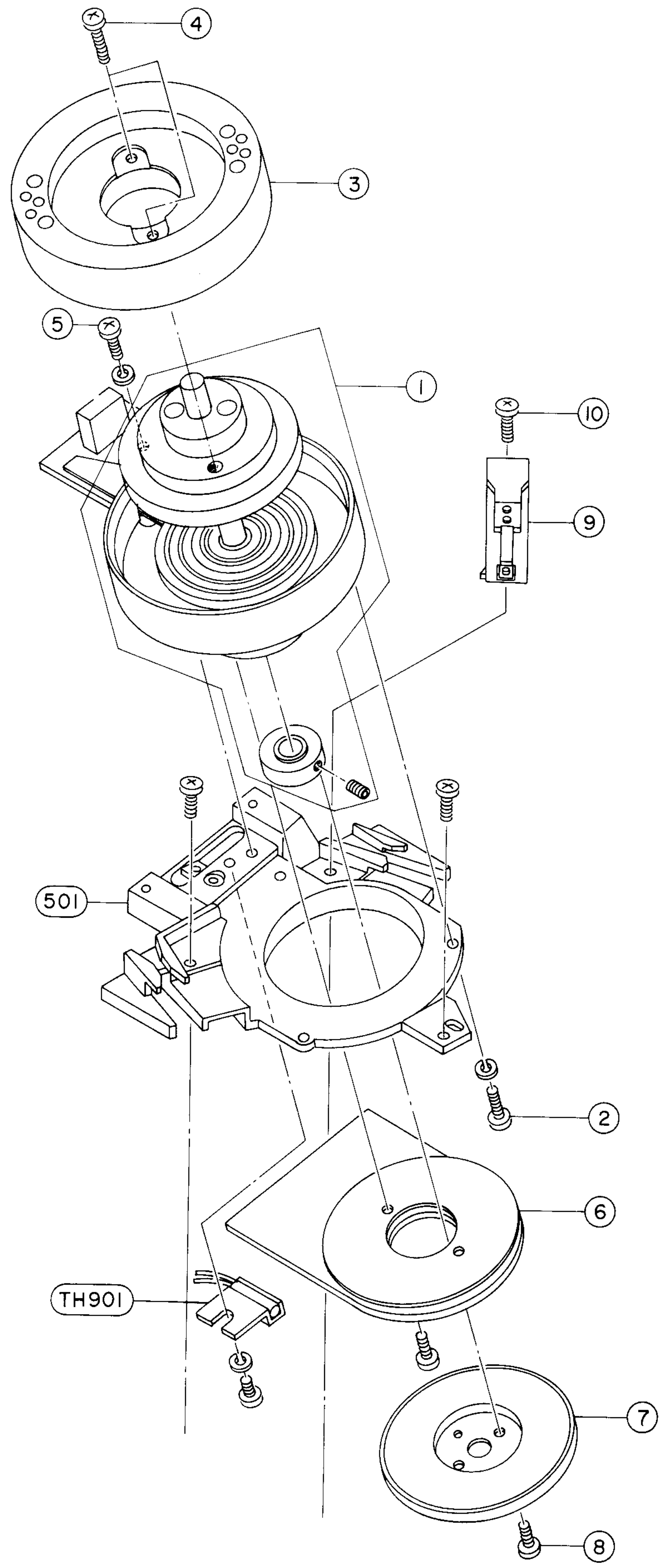
Ref. No.	Part No.	Description
1	BF-B360531-B	FLYWHEEL CAPSTAN PART
2	BL-B360350	ARM TENSION BAND PART
3	BM-B361467	LOADING MOTOR PART
4	BM-361745	MOTOR FG KCX-38FS5A NT
5	BM-M3224A020A	PC MOTOR BLK SM-240
6	BR-B365716-B	SUPPLY REEL TABLE PART 2
7	BR-B365715-B	TAKE-UP REEL TABLE PART 2
8	*BT-371514	TRANS POWER VS-X9
9	BV-V1047A090A	LOADING LEADER(L) BLK VS-112EG
10	BV-V1047A080A	LOADING LEADER(R) BLK VS-112EG
11	BV-371497	RF CONV/BOOSTER MCB4-UZ3604
12	ED-356424	D LED BG5525S GREEN
13	ED-357540	D LED LN59
14	ED-355607	D LED PR5505S RED
15	ED-705414	D LED SE303A INFRARED
16	ED-360409	D PHOTO PN323B
17	ED-371505	D SILICON DBB10G
18	ED-371512	D SILICON ERA22-04Y F05
19	ED-371510	D SILICON ERA22-08Y F05
20	ED-373187	D SILICON ERB83-004F10 40/1.7A
21	ED-371511	D SILICON ERB93-02E F15
22	ED-301911	D SILICON H DS448
23	ED-344280	D SILICON H GMA-01-FY2 F05
24	ED-371509	D SILICON H MA167
25	ED-371508	D SILICON H MA170
26	ED-307572	D SILICON H 1SS131
27	ED-624903	D SILICON H 1S2473
28	ED-369760	D ZENER H HZS15J B2 F05
29	ED-367576	D ZENER H HZS5.6J B2 F05
30	ED-367520	D ZENER H HZS5.6J B3 F05
31	ED-361915	D ZENER H HZS8.2J B3 F05
32	ED-367502	D ZENER H HZS9L A1 F05
33	ED-322046	D ZENER H HZ18 1
34	ED-329058	D ZENER H HZ5 C1
35	ED-346537	D ZENER H HZ9L A1
36	ED-346543	D ZENER H HZ9L C1
37	ED-367569	D ZENER H MA4036-H F05
38	ED-367570	D ZENER H MA4047-H F05
39	ED-371521	THERMISTOR ERT-D4ZEL5R0M
40	EE-363214	TV TUNER A25A
41	*EF-344106	FUSE ICP-N10 50V 0.4A
42	*EF-373142	FUSE ICP-N25 50V 1.0A
43	*EF-373143	FUSE ICP-N38 50V 1.5A
44	*EF-371585	FUSE ICP-N5 50V 0.25A
45	*EF-623125	FUSE SEMKO T 250V 2.50A
46	*EF-373012	FUSE TSC B 125V 3.15A W/LEAD
47	EH-360340-A	DL EFD-EN645A31P
48	EH-367472	DL EFD-EN645A32K
49	EH-371021	DL EFD-HR124A13J
50	EH-367469	DL EFD-HR645B15H
51	EH-367471	DL EFD-VR645A45E
52	EH-366894	FILTER CE SFE-4.16MB 4.16MHZ
53	EH-370812	FILTER CE SFE4.5MB
54	EH-367043	FILTER LC BP H289BNKN-7235LHD
55	EH-364067	FILTER LC BP H297BAIN-5969DCD
56	EH-361724	FILTER LC FF-28N
57	EH-364045	FILTER LC FF-78P
58	EH-364069	FILTER LC LP H289LNJN-6231LRD
59	EH-364066	FILTER LC LP H322LWQ-1166MAD
60	EH-373144	FILTER LC LP LF-69P-02 5P
61	EH-373145	FILTER LC LP LF-71N-02 5P
62	EI-364399	IC AN3311K
63	EI-360561	IC AN3792
64	EI-201970	IC AN5750
65	EI-371588	IC AN6359N
66	EI-356289	IC BA226A
67	EI-360648	IC BA5115
68	EI-353421	IC BA6229
69	EI-366892	IC BA7025L
70	EI-356820	IC BA7107
71	EI-371587	IC DT5A114E
72	EI-328693	IC HD14070BP
73	EI-371023-A	IC HH3201P
74	EI-367571	IC LA6358T
75	EI-353848	IC LA7808
76	EI-371683	IC MBM2212-25P-G
77	EI-361554	IC MB88301A-P
78	EI-372090	IC MB8851-1088M
79	EI-366681	IC MB88521-140M
80	EI-373193	IC MB88551-256N
81	EI-371589	IC MN6168XAQ
82	EI-360565	IC M5223P
83	EI-356811	IC M5224P
84	EI-359552	IC M5236L
85	EI-347769	IC M54514AP
86	EI-360564	IC M54548L
87	EI-360396	IC S-8054HN
88	EI-370614	IC TA8604N
89	EI-373023	IC TA8632N
90	EI-304657	IC TC4011BP
91	EI-200573	IC TC4053BP
92	EI-310036	IC TC4066BP
93	EI-363347	IC TC9018P
94	EI-301748	IC UPC1458C
95	EI-367271	IC UPC1490HA
96	EI-358506	IC UPC1513HA
97	EI-337530	IC UPC574J
98	EI-714630	IC UPD6102G
99	EI-367407	IC UPD6105C-002
100	EI-318924	OSC CE CSA4M 4MHZ
101	EI-347991	OSC CE CSA6.00MS 6MHZ
102	EI-720002	OSC CE CSB455P 455KHZ
103	EI-356371	OSC X'TAL MS-309 4.194304MHZ
104	EI-318384	OSC X'TAL NR-18 3.579545MHZ
105	EI-309878	OSC X'TAL 4.433619MHZ
106	EM-366754	IND LE LB-402MB4
107	*ER-360559	R FUSE H F12 RF50S 1/2W 1R0J
108	*ER-326169	R FUSE H S10 ERD2FC 1/4W 22R0G
109	*ER-318647	R FUSE H S10 ERD2FC 1/4W 4R7J
110	*ER-373181	R FUSE H S10 ERD2FC 1/4W 6800G
111	*ER-373158	R FUSE H S17 ERQ-12H 1/2W R27K
112	*ER-368461	R OMF H S12 FS 1W R22J
113	*ER-368456	R OMF H S15 FS 2W 121J
114	*ER-368457	R OMF H S20 FS 3W 333J
115	ES-360433	SW LEAF MRX
116	ES-361479	SW LEAF MSW-1594C
117	ES-353622-A	SW PUSH EVQ-WU7001 02-2
118	ES-371532	SW SEESAW JWZ2120-0107
119	ES-366697	SW SLIDE ESD-14137A 1-01-03N
120	ES-360408	SW SLIDE ESD-14187 1-01-02N
121	ES-364906	SW SLIDE HSW0789-01-800
122	ES-371027	SW SLIDE HSW0847-01-010 1-2
123	ES-349474	SW TACT SKHHAM004A
124	ET-361463	DETECTOR ON2170 Q,R
125	ET-371513	DETECTOR TLP521-1
126	ET-363953	TR DTA114TS
127	ET-371075	TR DTA124XS
128	ET-360646	TR DTA143ES
129	ET-354415	TR DTA144ES
130	ET-353897	TR DTC114ES
131	ET-360399	TR DTC114TS
132	ET-354365	TR DTC114YS
133	ET-354371	TR DTC124ES
134	ET-354414	TR DTC144ES
135	ET-370310	TR DTC144TS
136	ET-354094	TR DTC144WS
137	ET-361490	TR PHOTO PN268 R,S
138	ET-308472	TR 2SA1115 E,F,G F05
139	ET-364093	TR 2SA1283 E,F F05
140	ET-356224	TR 2SA1286 G,H,J F05
141	ET-305463	TR 2SA970 GR,BL
142	ET-322598	TR 2SB632K E,F
143	ET-356153	TR 2SB643 Q,R,S,T
144	ET-308141	TR 2SC2603 G F05
145	ET-709703	TR 2SC2673 P,Q
146	ET-353366	TR 2SC3112 A,B
147	ET-364153	TR 2SC3246 J,K F05
148	ET-349081	TR 2SC3383 S,T
149	ET-371506	TR 2SC3752
150	ET-338324	TR 2SD1012-V H F05
151	ET-370632	TR 2SD1405 BL,V
152	EV-369716	VR ROTARY RK09K1130 B103
153	EV-369717	VR ROTARY RK09K1130 B104
154	EV-370992	VR ROTARY RK09K1130 B504
155	EX-361672	DEW SENSOR (HEATER) MRX
156	EZ-371717	BATTERY LITHIUM CL2330-1VC
157	HE-361456	HEAD E HVFMD0005B
158	HR-361454	HEAD COMBO HVMLA1004C
159	MB-360534	BELT IDLER
160	MB-365408	BELT NTSC (2)
161	MB-364011	BELT SYNC NB930N15-020T
162	MP-361543-B	PINCH ROLLER PART
163	MZ-361314-A	GEAR (1)
164	MZ-360640-A	GEAR (2)
165	MZ-361313	GEAR (3)
166	MZ-360639	GEAR (4)
167	MZ-360638	GEAR (5)
168	MZ-364677	GEAR CAM EJECT(2)
169	MZ-364676	GEAR CAM MAIN(2)
170	MZ-B360642	GEAR EJECT PART
171	MZ-360384	GEAR LOADING (S)
172	MZ-360385-A	GEAR LOADING (T)
173	MZ-366960	GEAR TU BLK (2)
174	MZ-360453	WORM GEAR
175	VT-372187	ROTARY ENCORDER D2ZQ-R9-1
176	VT-360148-B	VERTICAL POLE PART

2. HEAD DRUM BLOCK

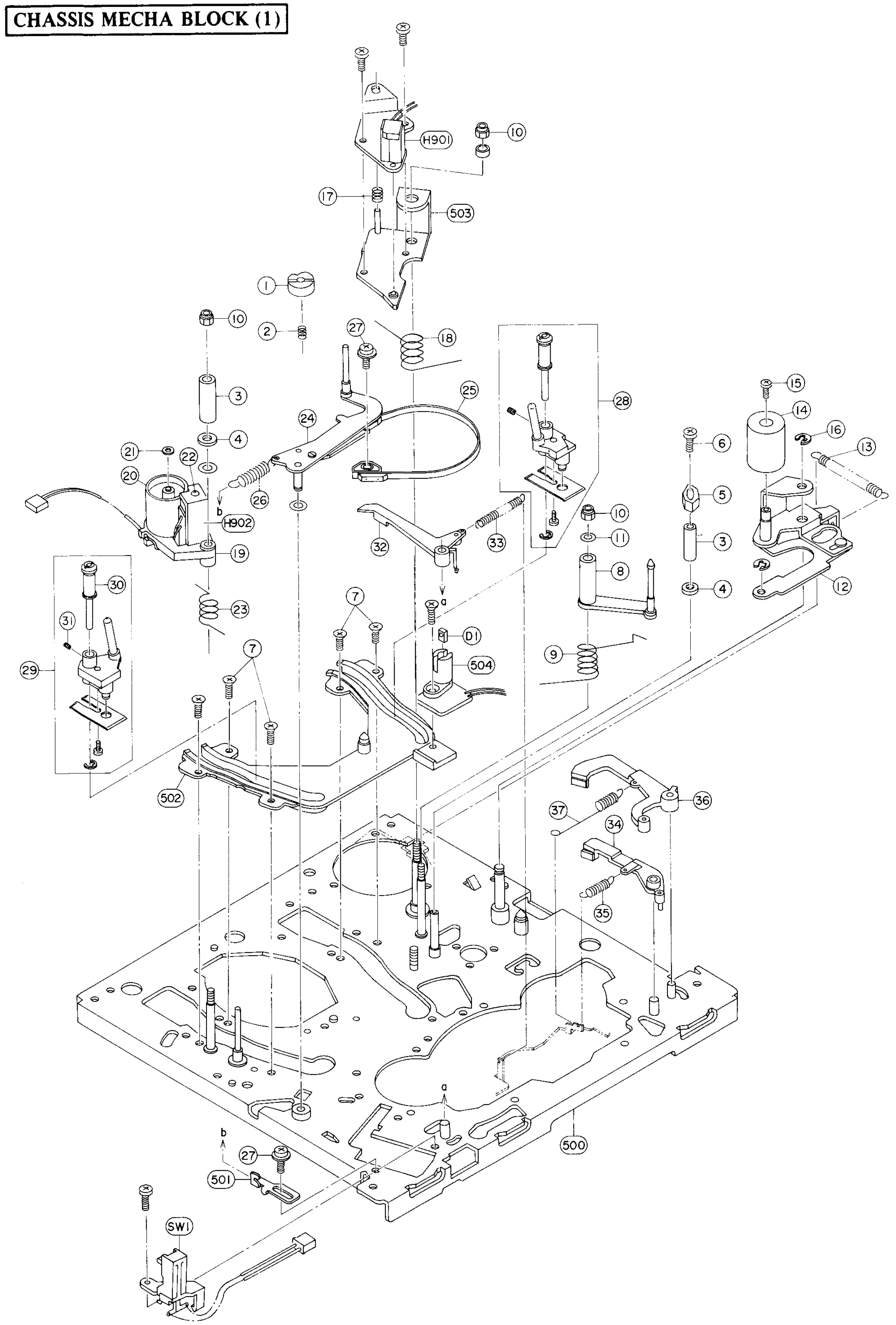
Ref. No.	Part No.	Description
2-1	BV-V1030A210G	LOWER DRUM BLK VS-X9EGN
2-2	ZS-354332	PAN26X08STL CMT SW
2-3	BV-V1030A220J	UPPER DRUM BLK VS-X9EGN
2-4	ZS-362241	BID30X09STL CMT
2-5	ZS-432843	PAN26X04STL CMT
2-TH901	EX-361672	DEW SENSOR (HEATER) MRX
2-6	BM-M3224A020A	PC MOTOR BLK SM-240
2-7	BV-B362443B	YOKE MAGNET (3) PART
2-8	ZS-356536	PAN26X06BRS NI3
2-9	VT-361452	DRUM EARTH SP ASSY(A)
2-10	ZS-421806	PAN30X08STL CMT

NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

HEAD DRUM BLOCK



CHASSIS MECHA BLOCK (1)



3. CHASSIS MECHA BLOCK (1)

Ref. No.	Part No.	Description
3-1	ZS-360372-A	SCREW ADJUST
3-2	ZG-363349	SP PUSH ADJUST SCREW
3-3	MS-372186	GUIDE TAPE (6)
3-4	MS-370840-A	GUIDE TAPE (5)
3-5	MS-362181	GUIDE TAPE TU
3-6	ZS-608095	PAN20X05STL CMT
3-7	ZS-360391	SCREW SPECIAL
3-8	BL-B360353	LEVER REVIEW PART
3-9	ZG-360605	SP TORSION REVIEW ARM
3-10	ZW-350839	N30 NYLON
3-11	ZW-324417	PW31X060X050PSL
3-12	BL-B360361-B	ARM PINCH ROLLER PART
3-13	ZG-360602	SP PULL PINCH
3-14	MP-361543-B	PINCH ROLLER PART
3-15	ZS-477876	PAN20X03STL CMT
3-16	ZW-270101	RING E 300SUP CMT
3-17	ZG-313258	SP C-03.5/0.80-10.0 C-102
3-18	ZG-360603	SP TORSION A/C HEAD
3-19	MZ-B362281	HOLDER FE HEAD (2) PART
3-20	MR-364335	ROLLER IMPEDANCE
3-21	ZW-361458	PUSH WASHER 16X032X025PSL
3-22	ZS-460440	PAN20X04STL CMT
3-23	ZG-360604	SP TORSION HOLDER FE HEAD
3-24	BL-B360342-A	LEVER TENSION PART
3-25	BL-B360350	ARM TENSION BAND PART
3-26	ZG-321731	SP T2-04.0/0.40-25.0 T2-115
3-27	ZS-200614	SCREW TRIPLE PAN30X06
3-28	BV-V1047A080A	LOADING LEADER(R) BLK VS-112EG
3-29	BV-V1047A090A	LOADING LEADER(L) BLK VS-112EG
3-30	VT-360148-B	VERTICAL POLE PART
3-31	ZS-321729	6SET20X040SCM PKR WP
3-32	BL-B360486	LEVER FF BRAKE PART
3-33	ZG-364338-A	SP PULL FF BRAKE
3-34	ML-B364686-A	LEVER SUB BRAKE(R-2) PART
3-35	ZG-364339	SP PULL REW BRAKE
3-36	ML-B364685	LEVER BRAKE REVIEW(2) PART
3-37	ZG-364337	SP PULL REVIEW BRAKE
3-D1	ED-357540	D LED LN59
3-H901	HR-361454	HEAD COMBO HVMLA1004C
3-H902	HE-361456	HEAD E HVFMD0005B
3-SW1	ES-360433	SW LEAF MRX

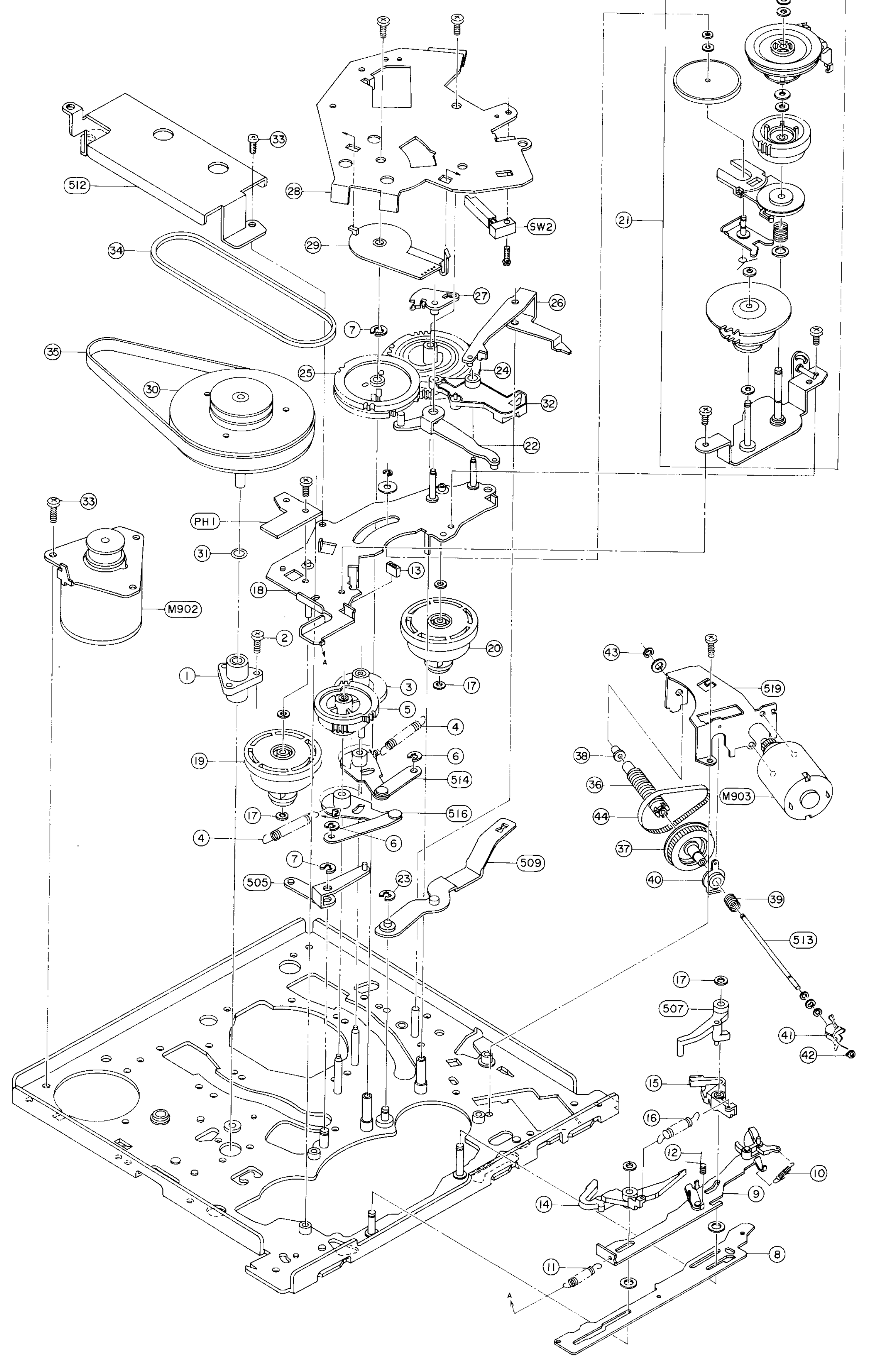
NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

4. CHASSIS MECHA BLOCK (2)

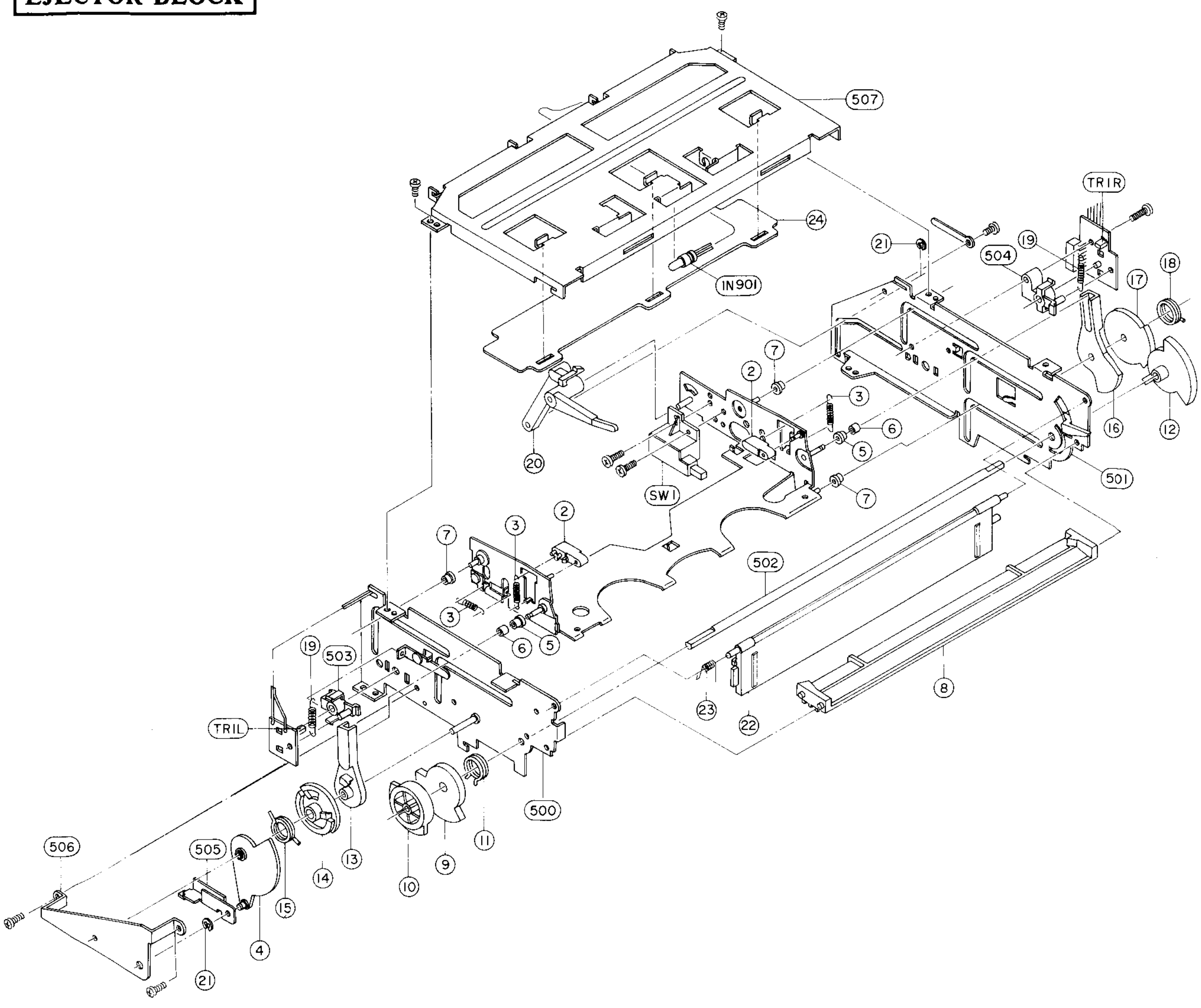
Ref. No.	Part No.	Description
4-1	MZ-B360528	HOLDER CAPSTAN PART
4-2	ZS-379350	PAN30X06STL CMT
4-3	MZ-360384	GEAR LOADING (S)
4-4	ZG-360601-A	SP PULL LOADING
4-5	MZ-360385-A	GEAR LOADING (T)
4-6	ZW-357164	RING E 230SUP CMT
4-7	ZW-270101	RING E 300SUP CMT
4-8	ML-366738	PLATE MAIN SLIDE(2)
4-9	MZ-B366734	PLATE F/R SLIDE (2)PART
4-10	ZG-358276	SP T6-03.2/0.20-12.5 T6-041
4-11	ZG-350891	SP T2-04.0/0.40-22.4 T2-114
4-12	ZG-360438	SP TORSION LIFTER
4-13	MB-366733	STOPPER SLIDE (2)
4-14	ML-B364684	ARM(TU) MAIM BRAKE(2) PART
4-15	ML-B364683	ARM(S) MAIN BRAKE(2) PART
4-16	ZG-366617	SP PULL MAIN BRAKE
4-17	ZW-360541	WASHER POLY SLIDER(3)
4-18	MZ-B360425-B	SUB FRAME PART
4-19	BR-B365715-B	TAKE-UP REEL TABLE PART 2
4-20	BR-B365716-B	SUPPLY REEL TABLE PART 2
4-21	MZ-366960	GEAR TU BLK (2)
4-22	ML-B360460-B	LEVER CAM SLIDE PART
4-23	ZW-410051	RETAINING RING E250SUP CMT
4-24	MZ-364677	GEAR CAM EJECT(2)
4-25	MZ-364676	GEAR CAM MAIN(2)
4-26	ML-B366735	LEVER CAM TENSION(2) PART
4-27	ML-366736	ARM SET FREE(2)
4-28	MZ-360477-B	PLATE MODE SW
4-29	VT-372187	ROTARY ENCORDER D2ZQ-R9-1
4-30	BF-B360531-B	FLYWHEEL CAPSTAN PART
4-31	ZW-360539	STOPPER OIL
4-32	ML-B366615-A	LEVER CAM F/R PART
4-33	ZS-379350	PAN30X06STL CMT
4-34	MB-360534	BELT IDLER
4-35	MB-365408	BELT NTSC (2)
4-36	MZ-360453	WORM GEAR
4-37	MR-364010	PULLEY WORM
4-38	ZW-360479-A	WASHER THRUST WORM
4-39	ZG-360441	SP TORSION ONE WAY
4-40	MZ-360440-A	HOLDER PULLEY WORM
4-41	MR-360432	PULLEY TRIGGER
4-42	ZW-361458	PUSH WASHER 16X032X025PSL
4-43	ZW-356657	RING E150SUP CMT
4-44	MB-364011	BELT SYNC NB930N15-020T
4-M902	BM-361745	MOTOR FG KCX-38FS5A NT
4-M903	BM-B361467	LOADING MOTOR PART
4-SW2	ES-361479	SW LEAF MSW-1594C
4-PH1	ET-361463	DETECTOR ON2170 Q,R

NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

CHASSIS MECHA BLOCK (2)



EJECTOR BLOCK



5. EJECTOR BLOCK

Ref. No.	Part No.	Description
5-1	BV-V1047A250E	EJECTOR BLK VS-240
5-2	ML-361316	ARM PRESSING
5-3	ZG-357865	SP T5-04.0/0.40-11.2 T5-108
5-4	MZ-B360642	GEAR EJECT PART
5-5	MR-361310	ROLLER (1)
5-6	MR-361311	ROLLER (2)
5-7	MR-361312	ROLLER (3)
5-8	SZ-360607	GUIDE
5-9	MZ-361314-A	GEAR (1)
5-10	MZ-361313	GEAR (3)
5-11	ZG-360615	SP TORSION (EJ)
5-12	MZ-360640-A	GEAR (2)
5-13	ML-360635	ARM LOADING (L)
5-14	MZ-360639	GEAR (4)
5-15	ZG-360614	SP TORSION (L)
5-16	ML-360634	ARM LOADING (R)
5-17	MZ-360638	GEAR (5)
5-18	ZG-360613	SP TORSION (R)
5-19	ZG-358212	SP T5-06.3/0.50-16.0 T5-180
5-20	BL-B361308	ARM LID OPENER PART
5-21	ZW-357164	RING E 230SUP CMT
5-IN901	EL-367397	PL CORD 14.0V 80MA 250/250
5-IN902	EL-367396	PL CORD 14.0V 80MA 190/190
5-SW1	ES-353622-A	SW PUSH EVQ-WU7001 02-2
5-TR1L	ET-361490	TR PHOTO PN268 R,S
5-TR1R	ET-361490	TR PHOTO PN268 R,S
5-22	SE-361317U-A	MASK CASSETTE VS-X9EGN
5-23	ZG-360616	SP TORSION
5-24	SP-364666	PLATE MIRROR (2)

NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

6. P.C BOARD BLOCK

Ref. No.	Part No.	Description
6-1	BA-V1073A300A	PC MAIN (EGN) BLK VS-X9EGN
6-2	BA-V1073A500A	PC VIDEO EGN BLK VS-X9EGN
6-3	BA-V1073A330A	PC OPERATION BLK VS-X9EGN
6-4	BA-V1073A350A	PC SW POWER BLK VS-X9EGN
6-5	BA-V1073A400A	PC PRE AMP EGN BLK VS-X9EGN

NOTE: PC MAIN BLK CONSISTS OF FOLLOWING P.C BOARD.

- MAIN (A) P.C BOARD
- MAIN (B) P.C BOARD

7. MAIN (A) P.C BOARD

Ref. No.	Part No.	Description
7-BT101	*EZ-371717	BATTERY LITHIUM CL2330-1VC
7-BT102	*EZ-371717	BATTERY LITHIUM CL2330-1VC
7-D1	ED-367570	D ZENER H MA4047-H F05
7-D2	ED-344280	D SILICON H GMA-01-FY2 F05
7-D3	ED-344280	D SILICON H GMA-01-FY2 F05
7-D4	ED-344280	D SILICON H GMA-01-FY2 F05
7-D5	ED-344280	D SILICON H GMA-01-FY2 F05
7-D6	ED-344280	D SILICON H GMA-01-FY2 F05
7-D7	ED-344280	D SILICON H GMA-01-FY2 F05
7-D8	ED-344280	D SILICON H GMA-01-FY2 F05
7-D8	ED-344280	D SILICON H GMA-01-FY2 F05
7-D9	ED-344280	D SILICON H GMA-01-FY2 F05
7-D10	ED-344280	D SILICON H GMA-01-FY2 F05
7-D11	ED-344280	D SILICON H GMA-01-FY2 F05
7-D12	ED-369760	D ZENER H HZS15J B2 F05
7-D101	ED-361915	D ZENER H HZS8.2J B3 F05
7-D102	ED-344280	D SILICON H GMA-01-FY2 F05
7-D103	ED-344280	D SILICON H GMA-01-FY2 F05
7-D104	ED-344280	D SILICON H GMA-01-FY2 F05
7-D105	ED-344280	D SILICON H GMA-01-FY2 F05
7-D106	ED-344280	D SILICON H GMA-01-FY2 F05
7-D107	ED-344280	D SILICON H GMA-01-FY2 F05
7-D108	ED-344280	D SILICON H GMA-01-FY2 F05
7-D109	ED-344280	D SILICON H GMA-01-FY2 F05
7-D110	ED-344280	D SILICON H GMA-01-FY2 F05
7-D111	ED-344280	D SILICON H GMA-01-FY2 F05
7-D112	ED-344280	D SILICON H GMA-01-FY2 F05
7-D113	ED-367576	D ZENER H HZS5.6J B2 F05
7-D114	ED-344280	D SILICON H GMA-01-FY2 F05
7-D115	ED-367569	D ZENER H MA4036-H F05
7-D116	ED-367520	D ZENER H HZS5.6J B3 F05
7-D117	ED-344280	D SILICON H GMA-01-FY2 F05
7-D118	ED-344280	D SILICON H GMA-01-FY2 F05
7-D119	ED-344280	D SILICON H GMA-01-FY2 F05
7-D201	ED-344280	D SILICON H GMA-01-FY2 F05
7-D202	ED-367502	D ZENER H HZS9L A1 F05
7-D203	ED-346537	D ZENER H HZ9L A1
7-D204	ED-346537	D ZENER H HZ9L A1
7-D205	ED-346537	D ZENER H HZ9L A1
7-D206	ED-344280	D SILICON H GMA-01-FY2 F05
7-D207	ED-301911	D SILICON H DS448
7-D208	ED-344280	D SILICON H GMA-01-FY2 F05
7-D209	ED-344280	D SILICON H GMA-01-FY2 F05
7-D210	ED-344280	D SILICON H GMA-01-FY2 F05
7-D211	ED-344280	D SILICON H GMA-01-FY2 F05
7-D212	ED-367502	D ZENER H HZS9L A1 F05
7-D251	ED-346543	D ZENER H HZ9L C1
7-FL251	EO-360647	COIL OSC 1 MX-102
7-FR1	*ER-360559	R FUSE H F12 RF50S 1/2W 1R0J
7-FR201	*ER-373181	R FUSE H S10 ERD2FC 1/4W 6800G
7-FR251	*ER-326169	R FUSE H S10 ERD2FC 1/4W 22R0G
7-IC1	EI-367571	IC LA6358T
7-IC2	EI-200573	IC TC4053BP
7-IC3	EI-360561	IC AN3792
7-IC4	EI-200573	IC TC4053BP
7-IC5	EI-304657	IC TC4011BP
7-IC6	EI-367571	IC LA6358T
7-IC7	EI-371588	IC AN6359N
7-IC8	EI-371589	IC MN6168XAQ
7-IC9	EI-356289	IC BA226A
7-IC10	EI-360564	IC M54548L
7-IC101	EI-353421	IC BA6229
7-IC102	EI-356811	IC M5224P
7-IC103	EI-360396	IC S-8054HN
7-IC104	EI-366681	IC MB88521-140M
7-IC201	EI-337530	IC UPC574J
7-IC251	EI-360648	IC BA5115
7-IC252	EI-358506	IC UPC1513HA
7-J1	EJ-371029	PIN J YKC21-5210 YELLOW 2P
7-J2	EJ-371030	PIN J YKC21-5187 BLACK 2P
7-L201	EO-345881	COIL FIX 1 EL0606SKI 101J
7-L202	EO-345881	COIL FIX 1 EL0606SKI 101J
7-L203	EO-351861	COIL FIX 1 LAL02 F05 100J
7-L251	EO-370639	COIL FIX 1 L-8 272J
7-L252	EO-370638	COIL FIX 1 L-8 123J
7-SF1	*EF-344106	FUSE ICP-N10 50V 0.4A
7-SF101	*EF-371585	FUSE ICP-N5 50V 0.25A
7-TR1	ET-308472	TR 2SA1115 E,F,G F05
7-TR2	ET-354365	TR DTC114YS
7-TR3	ET-360399	TR DTC114TS
7-TR4	ET-356224	TR 2SA1286 G,H,J F05
7-TR5	ET-308472	TR 2SA1115 E,F,G F05
7-TR6	ET-308472	TR 2SA1115 E,F,G F05
7-TR7	ET-370310	TR DTC144TS
7-TR8	ET-308472	TR 2SA1115 E,F,G F05
7-TR9	ET-354414	TR DTC144ES
7-TR10	ET-354414	TR DTC144ES
7-TR11	ET-370310	TR DTC144TS
7-TR12	ET-308472	TR 2SA1115 E,F,G F05
7-TR13	ET-354414	TR DTC144ES
7-TR14	ET-308141	TR 2SC2603 G F05
7-TR15	ET-353897	TR DTC114ES
7-TR16	ET-353897	TR DTC114ES
7-TR17	ET-370310	TR DTC144TS
7-TR18	ET-308141	TR 2SC2603 G F05
7-TR19	ET-308141	TR 2SC2603 G F05
7-TR20	ET-308141	TR 2SC2603 G F05
7-TR21	ET-370310	TR DTC144TS
7-TR22	ET-354414	TR DTC144ES
7-TR101	ET-308141	TR 2SC2603 G F05
7-TR102	ET-308472	TR 2SA1115 E,F,G F05
7-TR103	ET-370310	TR DTC144TS
7-TR104	ET-370310	TR DTC144TS
7-TR105	ET-308472	TR 2SA1115 E,F,G F05
7-TR106	ET-354094	TR DTC144WS
7-TR107	ET-363953	TR DTA114TS
7-TR108	ET-363953	TR DTA114TS
7-TR109	ET-354371	TR DTC124ES
7-TR110	ET-308472	TR 2SA1115 E,F,G F05
7-TR111	ET-349081	TR 2SC3383 S,T
7-TR112	ET-308472	TR 2SA1115 E,F,G F05
7-TR113	ET-308141	TR 2SC2603 G F05
7-TR114	ET-308141	TR 2SC2603 G F05
7-TR201	ET-308141	TR 2SC2603 G F05
7-TR202	ET-305463	TR 2SA970 GR,BL
7-TR203	ET-353366	TR 2SC3112 A,B
7-TR204	ET-353897	TR DTC114ES
7-TR205	ET-308472	TR 2SA1115 E,F,G F05
7-TR206	ET-308472	TR 2SA1115 E,F,G F05
7-TR207	ET-356224	TR 2SA1286 G,H,J F05
7-TR208	ET-308472	TR 2SA1115 E,F,G F05
7-TR209	ET-308472	TR 2SA1115 E,F,G F05
7-TR210	ET-308472	TR 2SA1115 E,F,G F05
7-TR211	ET-308141	TR 2SC2603 G F05
7-TR212	ET-308472	TR 2SA1115 E,F,G F05
7-TR213	ET-308472	TR 2SA1115 E,F,G F05
7-TR214	ET-308141	TR 2SC2603 G F05
7-TR215	ET-356224	TR 2SA1286 G,H,J F05

Ref. No.	Part No.	Description
7-TR216	ET-356224	TR 2SA1286 G,H,J F05
7-TR217	ET-308141	TR 2SC2603 G F05
7-TR251	ET-308141	TR 2SC2603 G F05
7-TR252	ET-360646	TR DTA143ES
7-TR253	ET-354414	TR DTC144ES
7-TR254	ET-354414	TR DTC144ES
7-TR255	ET-354414	TR DTC144ES
7-TR256	ET-354414	TR DTC144ES
7-TR257	ET-354414	TR DTC144ES
7-VR1	EV-366436	R S-FIX H VM6CKPV31S 3P0.3W104
7-VR2	EV-366436	R S-FIX H VM6CKPV31S 3P0.3W104
7-VR3	EV-366436	R S-FIX H VM6CKPV31S 3P0.3W104
7-VR4	EV-356582	R S-FIX H RH0615CS4J 3P 473
7-VR101	EV-363511	R S-FIX EVTK-4CA00BQ4 3P 473
7-VR251	EV-356582	R S-FIX H RH0615CS4J 3P 473
7-VR252	EV-356577	R S-FIX H RH0615C14J 3P 103
7-X101	EI-347991	OSC CE CSA6.00MS 6MHZ
7-1	SP-370064C	PANEL REAR EK
7-2	BV-V1073A900A	VIF FINAL BLK VS-X9EGN [INCL. 7-3]
7-3	EE-363214	TV TUNER A25A
7-4	BV-371497	RF CONV／BOOSTER MCB4-UZ3604

8. MAIN (B) P.C BOARD

Ref. No.	Part No.	Description
8-D301	ED-344280	D SILICON H GMA-01-FY2 F05
8-D302	ED-344280	D SILICON H GMA-01-FY2 F05
8-D303	ED-344280	D SILICON H GMA-01-FY2 F05
8-D304	ED-344280	D SILICON H GMA-01-FY2 F05
8-D305	ED-344280	D SILICON H GMA-01-FY2 F05
8-D306	ED-344280	D SILICON H GMA-01-FY2 F05
8-D307	ED-344280	D SILICON H GMA-01-FY2 F05
8-D308	ED-344280	D SILICON H GMA-01-FY2 F05
8-D309	ED-344280	D SILICON H GMA-01-FY2 F05
8-D310	ED-344280	D SILICON H GMA-01-FY2 F05
8-D311	ED-301911	D SILICON H DS448
8-D312	ED-301911	D SILICON H DS448
8-D313	ED-344280	D SILICON H GMA-01-FY2 F05
8-D314	ED-301911	D SILICON H DS448
8-D315	ED-344280	D SILICON H GMA-01-FY2 F05
8-D316	ED-301911	D SILICON H DS448
8-D317	ED-344280	D SILICON H GMA-01-FY2 F05
8-D318	ED-344280	D SILICON H GMA-01-FY2 F05
8-D319	ED-344280	D SILICON H GMA-01-FY2 F05
8-D320	ED-344280	D SILICON H GMA-01-FY2 F05
8-D321	ED-344280	D SILICON H GMA-01-FY2 F05
8-D322	ED-344280	D SILICON H GMA-01-FY2 F05
8-D323	ED-344280	D SILICON H GMA-01-FY2 F05
8-D324	ED-344280	D SILICON H GMA-01-FY2 F05
8-D325	ED-344280	D SILICON H GMA-01-FY2 F05
8-D326	ED-344280	D SILICON H GMA-01-FY2 F05
8-D327	ED-344280	D SILICON H GMA-01-FY2 F05
8-D328	ED-301911	D SILICON H DS448
8-D329	ED-301911	D SILICON H DS448
8-D330	ED-344280	D SILICON H GMA-01-FY2 F05
8-D331	ED-344280	D SILICON H GMA-01-FY2 F05
8-D332	ED-344280	D SILICON H GMA-01-FY2 F05
8-D333	ED-344280	D SILICON H GMA-01-FY2 F05
8-IC301	EI-372090	IC MB8851-1088M
8-IC302	EI-371587	IC DT5A114E
8-IC303	EI-371587	IC DT5A114E
8-IC304	EI-371587	IC DT5A114E
8-IC305	EI-201970	IC AN5750
8-IC306	EI-301748	IC UPC1458C
8-IC307	EI-304657	IC TC4011BP
8-IC308	EI-356289	IC BA226A
8-IC309	EI-360565	IC M5223P
8-IC310	EI-328693	IC HD14070BP
8-L301	EO-354600	COIL FIX 1 LAL02 F05 101K
8-L302	EO-354600	COIL FIX 1 LAL02 F05 101K
8-SW301	ES-371027	SW SLIDE HSW0847-01-010 1-2
8-TR301	ET-354414	TR DTC144ES
8-TR302	ET-354414	TR DTC144ES
8-TR303	ET-354414	TR DTC144ES
8-TR304	ET-356224	TR 2SA1286 G,H,J F05
8-TR305	ET-354415	TR DTA144ES
8-TR306	ET-356224	TR 2SA1286 G,H,J F05
8-TR307	ET-354415	TR DTA144ES
8-TR308	ET-354414	TR DTC144ES
8-TR309	ET-354094	TR DTC144WS
8-TR310	ET-308141	TR 2SC2603 G F05
8-TR311	ET-308141	TR 2SC2603 G F05
8-TR312	ET-308141	TR 2SC2603 G F05
8-TR313	ET-308141	TR 2SC2603 G F05
8-TR314	ET-308141	TR 2SC2603 G F05
8-TR315	ET-354414	TR DTC144ES
8-TR316	ET-354414	TR DTC144ES
8-TR317	ET-308472	TR 2SA1115 E,F,G F05
8-TR318	ET-308472	TR 2SA1115 E,F,G F05
8-TR319	ET-308141	TR 2SC2603 G F05
8-TR320	ET-354415	TR DTA144ES
8-TR321	ET-371075	TR DTA124XS
8-TR322	ET-354414	TR DTC144ES
8-TR323	ET-308141	TR 2SC2603 G F05
8-TR324	ET-308141	TR 2SC2603 G F05
8-TR325	ET-354414	TR DTC144ES
8-TR326	ET-354414	TR DTC144ES
8-TR327	ET-308141	TR 2SC2603 G F05
8-TR328	ET-308141	TR 2SC2603 G F05
8-VR301	EV-326719	R S-FIX V TM8KH1-1S 3P0.50W203
8-X301	EI-318924	OSC CE CSA4M 4MHZ

9. VIDEO P.C BOARD

Ref. No.	Part No.	Description
9-DL1	EH-367469	DL EFD-HR645B15H
9-DL2	EH-371021	DL EFD-HR124A13J
9-DL3	EH-367471	DL EFD-VR645A45E
9-DL4	EH-367472	DL EFD-EN645A32K
9-DL5	EH-360340-A	DL EFD-EN645A31P
9-D1	ED-344280	D SILICON H GMA-01-FY2 F05
9-D2	ED-344280	D SILICON H GMA-01-FY2 F05
9-D3	ED-344280	D SILICON H GMA-01-FY2 F05
9-D4	ED-344280	D SILICON H GMA-01-FY2 F05
9-D5	ED-344280	D SILICON H GMA-01-FY2 F05
9-D6	ED-344280	D SILICON H GMA-01-FY2 F05
9-D7	ED-344280	D SILICON H GMA-01-FY2 F05
9-D8	ED-344280	D SILICON H GMA-01-FY2 F05
9-D9	ED-344280	D SILICON H GMA-01-FY2 F05
9-D10	ED-344280	D SILICON H GMA-01-FY2 F05
9-D11	ED-344280	D SILICON H GMA-01-FY2 F05
9-D13	ED-344280	D SILICON H GMA-01-FY2 F05
9-D14	ED-344280	D SILICON H GMA-01-FY2 F05
9-D15	ED-344280	D SILICON H GMA-01-FY2 F05
9-D17	ED-344280	D SILICON H GMA-01-FY2 F05
9-D18	ED-344280	D SILICON H GMA-01-FY2 F05
9-D19	ED-344280	D SILICON H GMA-01-FY2 F05
9-FL1	EH-364067	FILTER LC BP H297BAIN-5969DCD
9-FL2	EH-367043	FILTER LC BP H289BNKN-7235LHD
9-FL3	EH-364069	FILTER LC LP H289LNJN-6231LRD
9-FL4	EH-361724	FILTER LC FF-28N
9-FL5	EH-364045	FILTER LC FF-78P
9-FL6	EH-373145	FILTER LC LP LF-71N-02 5P
9-FL7	EH-373144	FILTER LC LP LF-69P-02 5P
9-FL8	EH-364066	FILTER LC LP H322LWQ-1166MAD
9-FL9	EH-366894	FILTER CE SFE-4.16MB 4.16MHZ
9-FL10	EH-370812	FILTER CE SFE4.5MB
9-IC1	EI-366892	IC BA7025L
9-IC2	EI-366892	IC BA7025L
9-IC3	EI-370614	IC TA8604N
9-IC4	EI-373023	IC TA8632N
9-IC5	EI-356820	IC BA7107

Ref. No.	Part No.	Description
9-IC6	EI-200573	IC TC4053BP
9-IC7	EI-363347	IC TC9018P
9-IC8	EI-353848	IC LA7808
9-IC9	EI-367407	IC UPD6105C-002
9-IC10	EI-310036	IC TC4066BP
9-IC11	EI-371023-A	IC HH3201P
9-L1	EO-354600	COIL FIX 1 LAL02 F05 101K
9-L2	EO-360555	COIL FIX 1 LAL02 F05 180K
9-L3	EO-345888	COIL FIX 1 EL0606SKI 271J
9-L4	EO-345889	COIL FIX 1 EL0606SKI 331J
9-L5	EO-357508	COIL FIX 1 LAL02 F05 151K
9-L6	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L7	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L8	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L9	EO-353900	COIL FIX 1 LAL02 F05 150K
9-L10	EO-357508	COIL FIX 1 LAL02 F05 151K
9-L12	EO-351868	COIL FIX 1 LAL02 F05 470K
9-L13	EO-353900	COIL FIX 1 LAL02 F05 150K
9-L14	EO-351868	COIL FIX 1 LAL02 F05 470K
9-L15	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L16	EO-360555	COIL FIX 1 LAL02 F05 180K
9-L17	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L18	EO-353900	COIL FIX 1 LAL02 F05 150K
9-L19	EO-353900	COIL FIX 1 LAL02 F05 150K
9-L20	EO-353900	COIL FIX 1 LAL02 F05 150K
9-L22	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L23	EO-353901	COIL FIX 1 LAL02 F05 560K
9-L24	EO-360555	COIL FIX 1 LAL02 F05 180K
9-L25	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L26	EO-357507	COIL FIX 1 LAL02 F05 121K
9-L27	EO-357507	COIL FIX 1 LAL02 F05 121K
9-L28	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L29	EO-356599	COIL FIX 1 LAL02 F05 270K
9-L30	EO-357508	COIL FIX 1 LAL02 F05 151K
9-L31	EO-351868	COIL FIX 1 LAL02 F05 470K
9-L32	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L33	EO-353902	COIL FIX 1 LAL02 F05 680K
9-L34	EO-357507	COIL FIX 1 LAL02 F05 121K
9-L35	EO-357507	COIL FIX 1 LAL02 F05 121K
9-L36	EO-354600	COIL FIX 1 LAL02 F05 101K
9-L37	EO-354600	COIL FIX 1 LAL02 F05 101K
9-L38	EO-360555	COIL FIX 1 LAL02 F05 180K
9-L39	EO-360555	COIL FIX 1 LAL02 F05 180K
9-L40	EO-360555	COIL FIX 1 LAL02 F05 180K
9-L41	EO-360555	COIL FIX 1 LAL02 F05 180K
9-L42	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L43	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L44	EO-351865	COIL FIX 1 LAL02 F05 330J
9-L45	EO-353901	COIL FIX 1 LAL02 F05 560K
9-L46	EO-354600	COIL FIX 1 LAL02 F05 101K
9-L47	EO-345881	COIL FIX 1 EL0606SKI 101J
9-L48	EO-357509	COIL FIX 1 LAL02 F05 181K
9-L49	EO-354600	COIL FIX 1 LAL02 F05 101K
9-TR1	ET-308141	TR 2SC2603 G F05
9-TR2	ET-354414	TR DTC144ES
9-TR3	ET-354414	TR DTC144ES
9-TR4	ET-308472	TR 2SA1115 E,F,G F05
9-TR5	ET-308141	TR 2SC2603 G F05
9-TR7	ET-354414	TR DTC144ES
9-TR8	ET-308141	TR 2SC2603 G F05
9-TR9	ET-308141	TR 2SC2603 G F05
9-TR10	ET-360646	TR DTA143ES
9-TR11	ET-354415	TR DTA144ES
9-TR12	ET-354414	TR DTC144ES
9-TR13	ET-308141	TR 2SC2603 G F05
9-TR14	ET-308141	TR 2SC2603 G F05
9-TR15	ET-308141	TR 2SC2603 G F05
9-TR16	ET-308141	TR 2SC2603 G F05
9-TR17	ET-354415	TR DTA144ES
9-TR18	ET-308141	TR 2SC2603 G F05
9-TR19	ET-308141	TR 2SC2603 G F05
9-TR20	ET-308141	TR 2SC2603 G F05
9-TR21	ET-308141	TR 2SC2603 G F05
9-TR22	ET-308141	TR 2SC2603 G F05
9-TR21	ET-308141	TR 2SC2603 G F05
9-TR22	ET-308141	TR 2SC2603 G F05
9-TR23	ET-308141	TR 2SC2603 G F05
9-TR25	ET-308141	TR 2SC2603 G F05
9-TR26	ET-354415	TR DTA144ES
9-TR27	ET-308141	TR 2SC2603 G F05
9-TR28	ET-356224	TR 2SA1286 G,H,J F05
9-TR29	ET-354415	TR DTA144ES
9-TR30	ET-308141	TR 2SC2603 G F05
9-TR31	ET-354414	TR DTC144ES
9-TR32	ET-308141	TR 2SC2603 G F05
9-TR33	ET-308141	TR 2SC2603 G F05
9-TR34	ET-308472	TR 2SA1115 E,F,G F05
9-TR35	ET-308472	TR 2SA1115 E,F,G F05
9-TR36	ET-308141	TR 2SC2603 G F05
9-TR37	ET-354414	TR DTC144ES
9-TR38	ET-308141	TR 2SC2603 G F05
9-TR39	ET-308141	TR 2SC2603 G F05
9-TR40	ET-308472	TR 2SA1115 E,F,G F05
9-TR41	ET-308141	TR 2SC2603 G F05
9-TR42	ET-308472	TR 2SA1115 E,F,G F05
9-TR43	ET-308472	TR 2SA1115 E,F,G F05
9-TR44	ET-308141	TR 2SC2603 G F05
9-TR45	ET-308141	TR 2SC2603 G F05
9-TR46	ET-360399	TR DTC114TS
9-TR47	ET-354414	TR DTC144ES
9-TR48	ET-308472	TR 2SA1115 E,F,G F05
9-TR49	ET-308472	TR 2SA1115 E,F,G F05
9-TR50	ET-354415	TR DTA144ES
9-TR51	ET-354415	TR DTA144ES
9-TR52	ET-354414	TR DTC144ES
9-TR53	ET-354414	TR DTC144ES
9-TR54	ET-354414	TR DTC144ES
9-TR55	ET-308141	TR 2SC2603 G F05
9-TR56	ET-308141	TR 2SC2603 G F05
9-TR57	ET-308141	TR 2SC2603 G F05
9-TR58	ET-308141	TR 2SC2603 G F05
9-TR59	ET-308141	TR 2SC2603 G F05
9-TR61	ET-308141	TR 2SC2603 G F05
9-TR62	ET-308141	TR 2SC2603 G F05
9-TR63	ET-308141	TR 2SC2603 G F05
9-TR64	ET-308472	TR 2SA1115 E,F,G F05
9-TR65	ET-308141	TR 2SC2603 G F05
9-TR66	ET-308141	TR 2SC2603 G F05
9-TR67	ET-308472	TR 2SA1115 E,F,G F05
9-TR68	ET-308472	TR 2SA1115 E,F,G F05
9-TR69	ET-308141	TR 2SC2603 G F05
9-TR70	ET-354414	TR DTC144ES
9-TR71	ET-308472	TR 2SA1115 E,F,G F05
9-TR72	ET-354414	TR DTC144ES
9-TR73	ET-354414	TR DTC144ES
9-TR74	ET-354414	TR DTC144ES
9-TR75	ET-308141	TR 2SC2603 G F05
9-TR76	ET-308141	TR 2SC2603 G F05
9-VC1	EC-363331	C S-FIX H CTC-6U-030 5.5-30
9-VL1	EO-366893	COIL VARI 1 21D6 8.20MH
9-VL2	EO-366893	COIL VARI 1 21D6 8.20MH
9-VL3	EO-364063	COIL VARI 1 F291CNS-0665BS
9-VL4	EO-364062	COIL VARI 1 F291CNS-0666GW
9-VR1	EV-371174	R S-FIX H VM6CKPVB 3P 0.30W104
9-VR2	EV-371284	R S-FIX H VM6CKPVB 3P 0.30W203
9-VR3	EV-371281	R S-FIX H VM6CKPVB 3P 0.30W502
9-VR4	EV-356579	R S-FIX H RH0615C13J 3P 102
9-VR5	EV-371284	R S-FIX H VM6CKPVB 3P 0.30W203
9-VR6	EV-356583	R S-FIX H RH0615CN3J 3P 332
9-VR7	EV-356579	R S-FIX H RH0615C13J 3P 102
9-VR8	EV-351188	R S-FIX H VM6CKPVB 3P 0.30W503
9-X1	EI-309878	OSC X'TAL 4.433619MHZ
9-X2	EI-318384	OSC X'TAL NR-18 3.579545MHZ

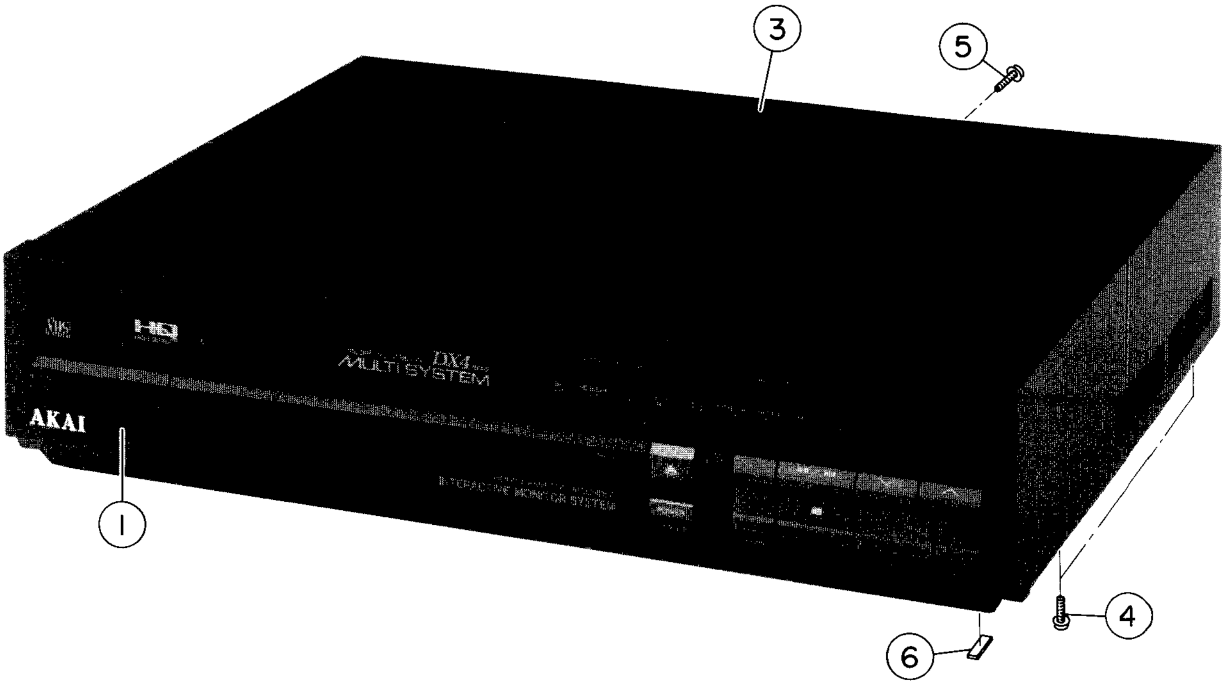
10. OPERATION P.C BOARD

Ref. No.	Part No.	Description
10-D1	ED-360409	D PHOTO PN323B
10-D2	ED-356424	D LED BG5525S GREEN
10-D3	ED-356424	D LED BG5525S GREEN
10-D4	ED-356424	D LED BG5525S GREEN
10-D5	ED-356424	D LED BG5525S GREEN
10-D6	ED-356424	D LED BG5525S GREEN
10-D7	ED-356424	D LED BG5525S GREEN
10-D8	ED-356424	D LED BG5525S GREEN
10-D9	ED-356424	D LED BG5525S GREEN
10-D10	ED-356424	D LED BG5525S GREEN
10-D11	ED-356424	D LED BG5525S GREEN
10-D12	ED-356424	D LED BG5525S GREEN
10-D13	ED-356424	D LED BG5525S GREEN
10-D14	ED-355607	D LED PR5505S RED
10-D15	ED-355607	D LED PR5505S RED
10-D16	ED-355607	D LED PR5505S RED
10-D17	ED-355607	D LED PR5505S RED
10-D18	ED-355607	D LED PR5505S RED
10-D19	ED-355607	D LED PR5505S RED
10-D20	ED-355607	D LED PR5505S RED
10-D21	ED-307572	D SILICON H 1SS131
10-D22	ED-307572	D SILICON H 1SS131
10-D23	ED-307572	D SILICON H 1SS131
10-D24	ED-624903	D SILICON H 1S2473
10-D25	ED-307572	D SILICON H 1SS131
10-IC1	EI-373193	IC MB88551-256N
10-IC2	EI-367271	IC UPC1490HA
10-IC3	EI-347769	IC M54514AP
10-IC4	EI-371683	IC MBM2212-25P-G
10-IC5	EI-361554	IC MB88301A-P
10-IC6	EI-360396	IC S-8054HN
10-IN1	EM-366754	IND LE LB-402MB4
10-SW1	ES-349474	SW TACT SKHHAM004A
10-SW2	ES-349474	SW TACT SKHHAM004A
10-SW3	ES-349474	SW TACT SKHHAM004A
10-SW4	ES-349474	SW TACT SKHHAM004A
10-SW5	ES-349474	SW TACT SKHHAM004A
10-SW6	ES-349474	SW TACT SKHHAM004A
10-SW7	ES-349474	SW TACT SKHHAM004A
10-SW8	ES-349474	SW TACT SKHHAM004A
10-SW9	ES-349474	SW TACT SKHHAM004A
10-SW10	ES-349474	SW TACT SKHHAM004A
10-SW11	ES-349474	SW TACT SKHHAM004A
10-SW12	ES-349474	SW TACT SKHHAM004A
10-SW13	ES-349474	SW TACT SKHHAM004A
10-SW14	ES-349474	SW TACT SKHHAM004A
10-SW15	ES-349474	SW TACT SKHHAM004A
10-SW16	ES-349474	SW TACT SKHHAM004A
10-SW17	ES-349474	SW TACT SKHHAM004A
10-SW18	ES-349474	SW TACT SKHHAM004A
10-SW19	ES-349474	SW TACT SKHHAM004A
10-SW20	ES-349474	SW TACT SKHHAM004A
10-SW21	ES-349474	SW TACT SKHHAM004A
10-SW22	ES-349474	SW TACT SKHHAM004A
10-SW23	ES-349474	SW TACT SKHHAM004A
10-SW24	ES-349474	SW TACT SKHHAM004A
10-SW25	ES-360408	SW SLIDE ESD-14187 1-01-02N [RF MODE SW]
10-SW26	ES-364906	SW SLIDE HSW0789-01-800 [MODE SELECT]
10-SW27	ES-366697	SW SLIDE ESD-14137A 1-01-03N [BAND SELECT]
10-SW28	ES-360408	SW SLIDE ESD-14187 1-01-02N [SPEED SELECT]
10-TR1	ET-356153	TR 2SB643 Q,R,S,T
10-TR2	ET-356153	TR 2SB643 Q,R,S,T
10-TR3	ET-354415	TR DTA144ES
10-TR4	ET-308472	TR 2SA1115 E,F,G F05
10-VR1	EV-369716	VR ROTARY RK09K1130 B103 [PICTURE]
10-VR2	EV-369717	VR ROTARY RK09K1130 B104 [TRACKING]
10-VR3	EV-370992	VR ROTARY RK09K1130 B504 [STILL TRACKING]
10-X1	EI-356371	OSC X'TAL MS-309 4.194304MHZ
10-2	SZ-364709	HOLDER LED (A)

11. SW POWER P.C BOARD

Ref. No.	Part No.	Description
11-C1	*EC-369818	C CE V CS17FZ 103Z 400AC
11-C2	*EC-369818	C CE V CS17FZ 103Z 400AC
11-C3	*EC-371515	C EC V KME 181M 400.0DC
11-C7	*EC-368474	C MMY V F15 MMH630 823K 630DC
11-C9	*EC-338411	C CE V FZ 103P 400AC
11-C10	*EC-338411	C CE V FZ 103P 400AC
11-C12	*EC-371516	C EC V SXE 152M 10.0DC
11-C13	*EC-371516	C EC V SXE 152M 10.0DC
11-C18	*EC-371518	C EC V SXE 470M 63.0DC
11-C19	*EC-371518	C EC V SXE 470M 63.0DC
11-C21	*EC-371517	C EC V SXE 152M 25.0DC
11-C22	*EC-371517	C EC V SXE 152M 25.0DC
11-C25	*EC-368527	C CE V F05 B 391K 1000DC
11-D1	*ED-371505	D SILICON DBB10G
11-D2	*ED-371509	D SILICON H MA167
11-D3	*ED-371508	D SILICON H MA170
11-D4	*ED-371508	D SILICON H MA170
11-D5	ED-371510	D SILICON ERA22-08Y F05
11-D6	ED-329058	D ZENER H HZ5 C1
11-D7	ED-344280	D SILICON H GMA-01-FY2 F05
11-D8	*ED-373187	D SILICON ERB83-004F10 40/1.7A
11-D9	ED-322046	D ZENER H HZ18 1
11-D10	*ED-371512	D SILICON ERA22-04Y F05
11-D11	*ED-371511	D SILICON ERB93-02E F15
11-D12	ED-344280	D SILICON H GMA-01-FY2 F05
11-D13	ED-624903	D SILICON H 1S2473
11-FL1	EO-373186	COIL LF ELF-18D 1.0MH
11-FR2	*ER-318647	R FUSE H S10 ERD2FC 1/4W 4R7J
11-FR3	*ER-373158	R FUSE H S17 ERQ-12H 1/2W R27K
11-F1	*EF-623125	FUSE SEMKO T 250V 2.50A
11-F2	*EF-373012	FUSE TSC B 125V 3.15A W/LEAD
11-IC1	*EI-359552	IC M5236L
11-L1	EO-523585	COIL FIX 1 FL09H 331K
11-L2	EO-523585	COIL FIX 1 FL09H 331K
11-L3	EO-523585	COIL FIX 1 FL09H 331K
11-PH1	ET-371513	DETECTOR TLP521-1
11-R3	*ER-368456	R OMF H S15 FS 2W 121J
11-R4	*ER-368457	R OMF H S20 FS 3W 333J
11-R19	*ER-368461	R OMF H S12 FS 1W R22J
11-SF1	*EF-373142	FUSE ICP-N25 50V 1.0A
11-SF2	*EF-373143	FUSE ICP-N38 50V 1.5A
11-TH1	*ED-371521	THERMISTOR ERT-D4ZEL5R0M
11-TR1	*ET-371506	TR 2SC3752
11-TR2	*ET-364093	TR 2SA1283 E,F F05
11-TR3	*ET-308472	TR 2SA1115 E,F,G F05
11-TR4	ET-364153	TR 2SC3246 J,K F05
11-TR5	*ET-322598	TR 2SB632K E,F
11-TR6	*ET-370632	TR 2SD1405 BL,V
11-TR7	*ET-308141	TR 2SC2603 G F05
11-TR8	*ET-364153	TR 2SC3246 J,K F05
11-TR9	*ET-360399	TR DTC114TS
11-T1	*BT-371514	TRANS POWER VS-X9
11-VR1	EV-307622	R S-FIX H RH0621CS2 3P0.30W471

FINAL ASSEMBLY BLOCK



12. PRE-AMP P.C BOARD

Ref. No.	Part No.	Description
12-FR1	*ER-326169	R FUSE H S10 ERD2FC 1/4W 22R0G
12-IC1	EI-364399	IC AN3311K
12-L1	EO-354600	COIL FIX 1 LAL02 F05 101K
12-L2	EO-357509	COIL FIX 1 LAL02 F05 181K
12-L3	EO-351863	COIL FIX 1 LAL02 F05 120J
12-L4	EO-345881	COIL FIX 1 EL0606SKI 101J
12-L5	EO-351868	COIL FIX 1 LAL02 F05 470K
12-TR1	ET-354414	TR DTC144ES
12-TR2	ET-308472	TR 2SA1115 E,F,G F05
12-TR3	ET-308141	TR 2SC2603 G F05
12-TR4	ET-308141	TR 2SC2603 G F05
12-TR5	ET-308141	TR 2SC2603 G F05
12-TR6	ET-308472	TR 2SA1115 E,F,G F05
12-TR7	ET-308472	TR 2SA1115 E,F,G F05
12-TR8	ET-354414	TR DTC144ES
12-TR9	ET-308141	TR 2SC2603 G F05
12-TR10	ET-354414	TR DTC144ES
12-TR11	ET-354414	TR DTC144ES
12-TR12	ET-308472	TR 2SA1115 E,F,G F05
12-TR13	ET-354414	TR DTC144ES
12-TR14	ET-308141	TR 2SC2603 G F05
12-TR15	ET-338324	TR 2SD1012-V H F05
12-TR16	ET-338324	TR 2SD1012-V H F05
12-TR17	ET-338324	TR 2SD1012-V H F05
12-TR18	ET-338324	TR 2SD1012-V H F05
12-TR19	ET-338324	TR 2SD1012-V H F05
12-TR20	ET-338324	TR 2SD1012-V H F05
12-VR1	EV-372268	R S-FIX V RH0614C 3P 102

13. FINAL ASSEMBLY BLOCK

Ref. No.	Part No.	Description
13-1	BD-V1073A130A	PANEL FRONT BLK VS-X9EGN-B
13-2	SK-364643	KNOB SEARCH SLIDE
13-3	SP-369714E-A	COVER UPPER EGN
13-4	ZS-362378	PLX BID30X10STL CMT
13-5	ZS-361105	PLX BID30X08STL BNI
13-6	SA-353927B	FOOT(2)
13-7	*EW-373141	AC CORD200KP-419CLTCE2 FHB115AE
13-SW1	*ES-371532	SW SEESAW JWZ2120-0107 [POWER]
13-8	EZ-372022	HOLDER PC EGN

14. ACCESSORY

Ref. No.	Part No.	Description
14-1	EW-348414	CORD PAL
14-2	AX-359649	AC ADAPTER S-I6115

15. REMOTE CONTROL UNIT RC-V240

Ref. No.	Part No.	Description
15-1	AV-369769	REMOCON RC-V240B-EB
15-IC1	EI-714630	IC UPD6102G
15-D1	ED-705414	D LED SE303A INFRARED
15-D2	ED-307572	D SILICON H 1SS131
15-D3	ED-307572	D SILICON H 1SS131
15-Q1	ET-709703	TR 2SC2673 P,Q
15-MF1	EI-720002	OSC CE CSB455P 455KHZ
15-2-B	SC-720004	COVER BATTERY RC-V270/V240-B

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Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
AV-369769	15-1	ED-344280	7-D8	ED-355607	10-D15	EH-364066	59
AX-359649	14-2	ED-344280	7-D8	ED-355607	10-D16	EH-364066	9-FL8
BA-V1073A300A	6-1	ED-344280	7-D9	ED-355607	10-D17	EH-364067	55
BA-V1073A330A	6-3	ED-344280	7-D10	ED-355607	10-D18	EH-364067	9-FL1
BA-V1073A350A	6-4	ED-344280	7-D11	ED-355607	10-D19	EH-364069	58
BA-V1073A400A	6-5	ED-344280	7-D102	ED-355607	10-D20	EH-364069	9-FL3
BA-V1073A500A	6-2	ED-344280	7-D103	ED-356424	12	EH-366894	52
BD-V1073A130A	13-1	ED-344280	7-D104	ED-356424	10-D2	EH-366894	9-FL9
BF-B360531-B	1	ED-344280	7-D105	ED-356424	10-D3	EH-367043	54
BF-B360531-B	4-30	ED-344280	7-D106	ED-356424	10-D4	EH-367043	9-FL2
BL-B360342-A	3-24	ED-344280	7-D107	ED-356424	10-D5	EH-367469	50
BL-B360350	2	ED-344280	7-D108	ED-356424	10-D6	EH-367469	9-DL1
BL-B360350	3-25	ED-344280	7-D109	ED-356424	10-D7	EH-367471	51
BL-B360353	3-8	ED-344280	7-D110	ED-356424	10-D8	EH-367471	9-DL3
BL-B360361-B	3-12	ED-344280	7-D111	ED-356424	10-D9	EH-367472	48
BL-B360486	3-32	ED-344280	7-D112	ED-356424	10-D10	EH-367472	9-DL4
BL-B361308	5-20	ED-344280	7-D114	ED-356424	10-D11	EH-370812	53
BM-B361467	3	ED-344280	7-D117	ED-356424	10-D12	EH-370812	9-FL10
BM-B361467	4-M903	ED-344280	7-D118	ED-356424	10-D13	EH-371021	49
BM-M3224A020A	5	ED-344280	7-D119	ED-357540	13	EH-371021	9-DL2
BM-M3224A020A	2-6	ED-344280	7-D201	ED-357540	3-D1	EH-373144	60
BM-361745	4	ED-344280	7-D206	ED-360409	16	EH-373144	9-FL7
BM-361745	4-M902	ED-344280	7-D208	ED-360409	10-D1	EH-373145	61
BR-B365715-B	7	ED-344280	7-D209	ED-361915	31	EH-373145	9-FL6
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MEMO

ABBREVIATIONS (VIDEO)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
AC	Alternating Current	LM STP	Loading Motor SToP
ACC	Auto Color Control	LP	Long Play
A/C	Audio and Control	LPF	Low Pass Filter
ADJ	ADJust(ment)	LSW	Loading SWitch
AFC	Auto Frequency Control	ME-SECAM	Middle East SECAM
AFT	Auto Fine Tuning	MI-COM	MIcro COMputer
AGC	Auto Gain Control	MM	Mono-stayble Multi
AH(P)	Audio Head (Play Back)	MRS	Motor ReverSe
AH(R)	Audio Head (Record)	NG	Noise Gate
AL	ALl	NON-LIN	NON-LINear
AL	ALways	N.T.S.C.	National Television System Committee
ALC	Auto Level Control	O MUTE	Output MUTE
A-SW·P	Audio-SWitching·Pulse	OSC	OSCillator
A·MUTE	Audio·MUTE	PAL	Phase Alternation Line
AUT/MAN	AUTO/MANual	PB	Play Back
ANT	ANTenna	P-COM	Phase-COMparator
APC	Automatic Phase Control	PDN	Power DowN
ASSY	ASSemblY	PG	Pulse Generator
BAL	BALance	PL, PLG	PLunger (PLunGer)
B/C	Buzz and Charactor	POS	POSition
B DOWN	Break DOWN	PRG	PRoGram
BGP	Burst Gate Pulse	P & S	Power supply & System control
BLK	BLacK or BLock	PU	Pick Up (head, pulse)
BM	Balanced Modulator	PWR	PoWeR
BPF	Band Pass Filter	Q	Quality factor
BS	Band Select	RC	Rotary Control
BS (SB)	Brake Supply (Supply Brake)	REC	RECord
BT (TB)	Brake Takeup (Takeup Brake)	REF	REFerence
BU	Back Up	REF-V	REFerence Vertical signal
B/W	Black and White	REG	REGulator
CCIR	Comité Consultatif International des Radio Communications	REV (REVW)	REView (REVieW)
		REW	REWind
CH (Ch.)	CHannel (Channel)	RFB	Radio Frequency Booster
CK	Color Killer	RM	Reel Motor
CLK	CLocK	RM PWR	Reel Motor PoWeR
CLP	CLiP	R·S SW	Record·Safety SWitch
CM	Capstan Motor	RST (RES)	ReSeT (RESet)
CN	CoNnector	RVS	ReVerSe
COMP	COMParator	S	Sensor, Shield
Comp	Comparison	SC	SimulCast
C or R	Cue or Review	S CLK	Serial CLocK
CR 1	Cue Review 1 (high)	S & A	Servo & Audio
CSW	Cassette SWitch	SECAM	Séquentiel à Memoire
CTL	ConTroL	SEP (SEPA)	SEParator (SEPArator)
CUE	CUE	SFP	Sync Front Pulse
CW	Carrier Wave	S & H	Sample and Hold
DAC	Digital to Analog Converter	SLP	Super Long Play
DC	Direct Current	SP	Standard Play
DEMOD	DEMODulator	SPD	SPeeD
DET	DETect (DETector)	SRP	Supply Reel Pulse
DL	Delay Line	SRV	SeRVo
DM	Drum Motor	SOW	Sync On Word
DOC	Drop Out Compensator	STBY	STandBY
D·P·E	Drum·Phase·Error	SW	SWitch
D·PG	Drum·Pulse Generator	SW'NG	SWitchiNG
D·TPZ	Drum·TraPeZoid	SWP	SWitching Pulse
EE	Electronic to Electronic	SYNC	SYNChronize
EF	Emitter Follower	T-AUDIO	Tuner AUDIO
EM	Eject Motor	TA-MUTE	Tuner Audio MUTE
EMPHA	EMPHAsis	TPZ (TRAPE)	TraPeZoid (TRAPEzoid)
ENVIN	ENVelope INput	TRK	TRacKing
ESW	Eject SWitch	TRP	Take up Reel Pulse
EQ	EQualizer	T/U	Take Up
FE	Full track Erase	TV	TeleVision
FF	Flip-Flop	UHF	Ultra High Frequency
FG	Frequency Generator	UNR	UNRegulated
Fig.	Figure	V	Vertical
FM	Frequency Modulation	VCO	Voltage Controlled Oscillator
Fo	resonance Frequency	VD	Vertical Drive
FREQ	FREQuency	VF	Voltage for Fine tuning
FSI	Field Start Inhibit	VHF	Very High Frequency
GND	GrouND	VHS	Video Home System
H	Horizontal	VID	VIDeo
HP	Horizontal (sync) Pulse	VIDEO-J	VIDEO Judge
HPF	High Pass Filter	VIF	Video Intermediate Frequency
HT	HeaTer	VJ	Video Judge
IC	Integrated Circuit	VM	Voltage for Memory
ID	IDentification	VOB	Video On Blank
IDL	IDLe (Voltage)	VOW	Video On Word
INS	INSert	VP	Vertical (sync) Pulse
INV	INVerter	VT	Voltage for Tuning
L·CTL	Lamp·ConTroL	WHT	WHiTe
LED	Light Emitting Diode	2H	2 Hour (SP)
LDI	LoaD Input	6H	6 Hour (SLP)
LM	Loading Motor		

AKAI

MODEL VS-X9EGN

SCHEMATIC DIAGRAM
AND PC BOARDS

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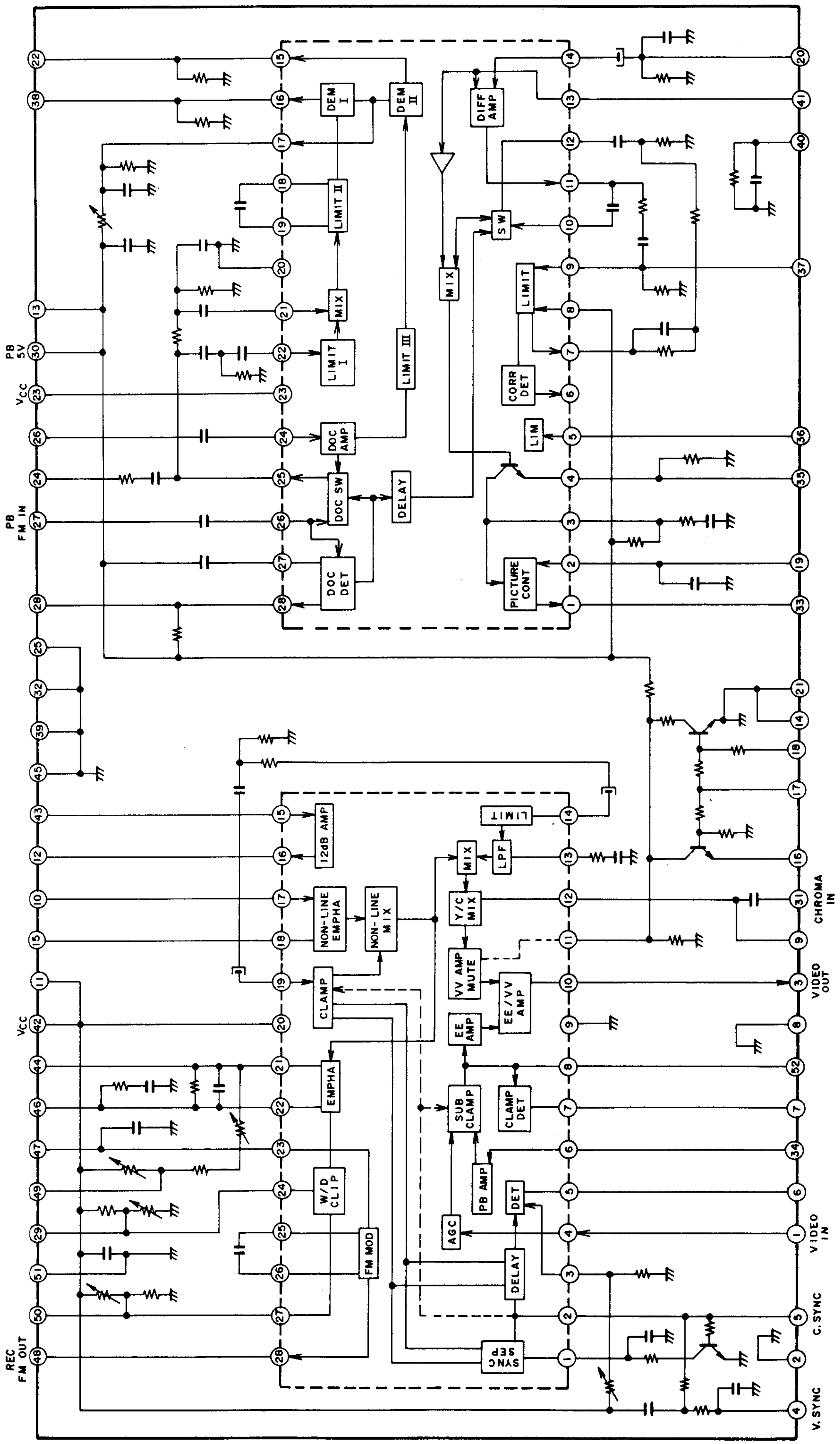
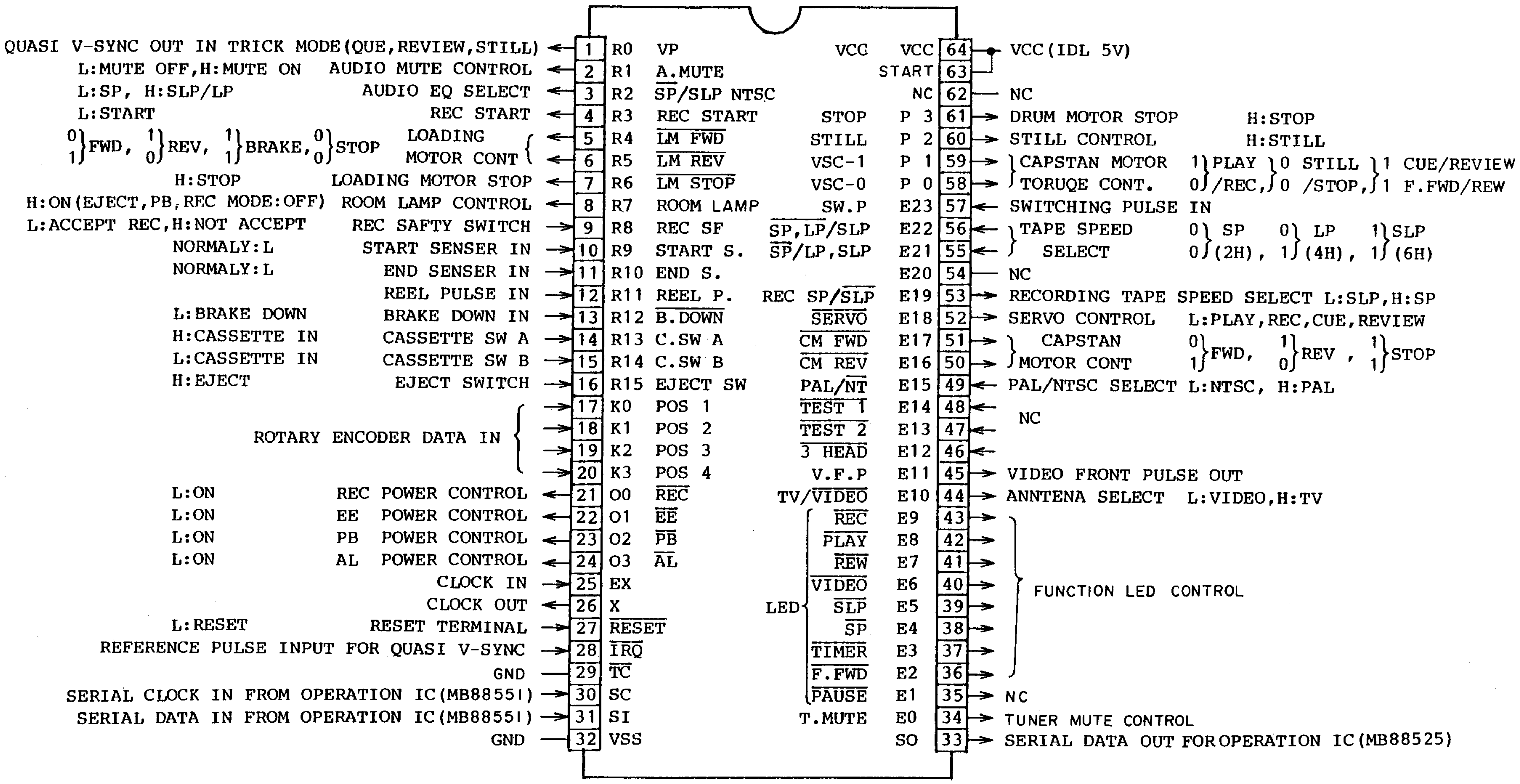
HH3201P(Y SIGNAL PROCCESSING IG)



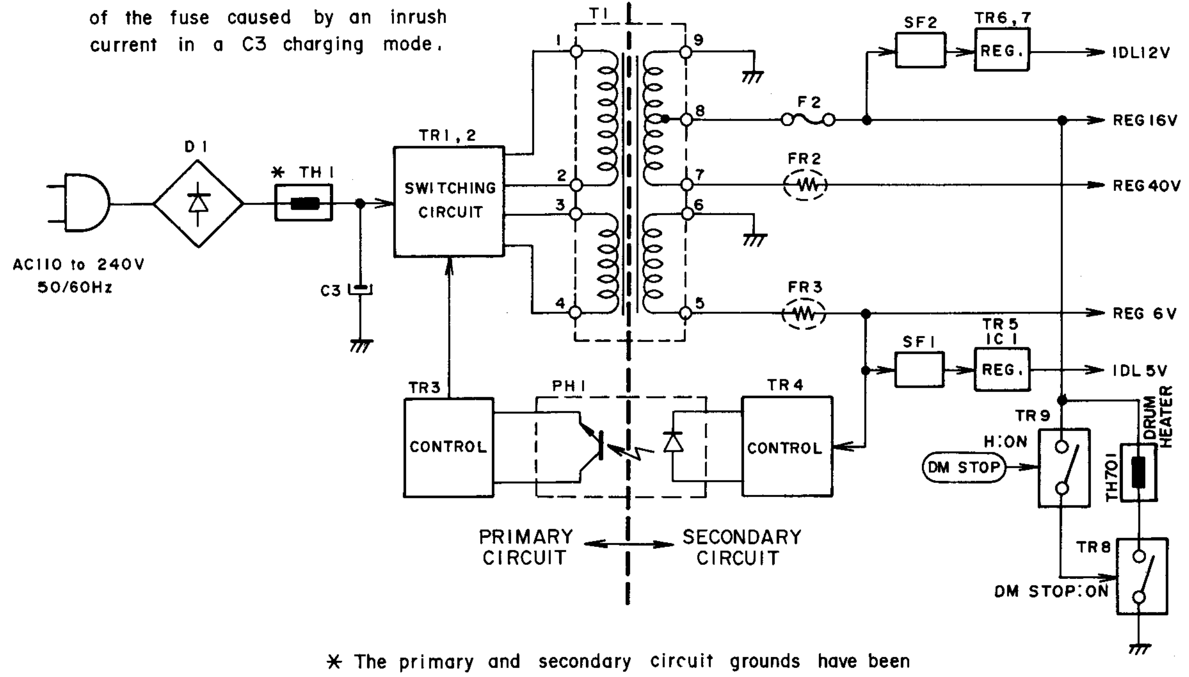
PB 5V
VCC
PB FM IN
REC FM OUT
DEM I
DEM II
DIFF AMP
LIMIT II
MIX
LIMIT I
LIMIT III
DOC AMP
DOC SW
DELAY
DOC DET
SW
LIMIT
CORR DET
LIM
PICTURE CONT
12dB AMP
NON-LINE EMPHA
NON-LINE MIX
CLAMP
EMPHA
W/D CLIP
FM MOD
LIMIT
LPF
MIX
Y/C MIX
VV AMP MUTE
EE/VV AMP
EE AMP
SUB CLAMP
CLAMP DET
PB AMP
DET
AGC
DELAY
SYNC SEP
CHROMA IN
VIDEO OUT
VIDEO IN
C. SYNC
V. SYNC

MB88521-140M(SYSTEM CONTROL CPU)

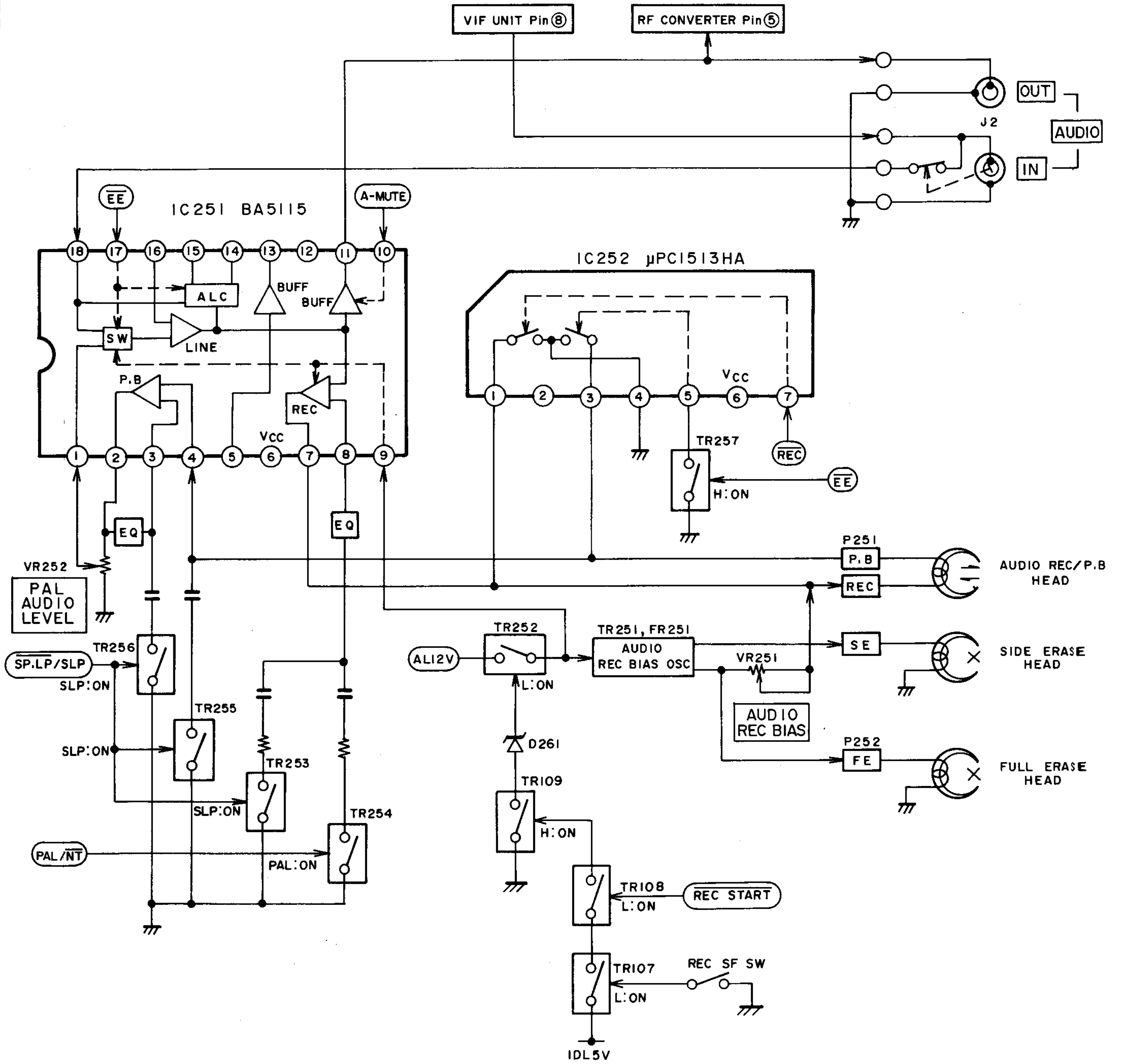

QUASI V-SYNC OUT IN TRICK MODE(QUE,REVIEW,STILL) 1 R0 VP
L:MUTE OFF,H:MUTE ON AUDIO MUTE CONTROL 2 R1 A.MUTE
L:SP, H:SLP/LP AUDIO EQ SELECT 3 R2 SP/SLP NTSC
L:START REC START 4 R3 REC START
0 1 FWD, 1 0 REV, 1 1 BRAKE, 0 0 STOP LOADING MOTOR CONT 5 R4 LM FWD
6 R5 LM REV
H:STOP LOADING MOTOR STOP 7 R6 LM STOP
H:ON(EJECT,PB,REC MODE:OFF) ROOM LAMP CONTROL 8 R7 ROOM LAMP
L:ACCEPT REC,H:NOT ACCEPT REC SAFTY SWITCH 9 R8 REC SF
NORMALY:L START SENSER IN 10 R9 START S.
NORMALY:L END SENSER IN 11 R10 END S.
REEL PULSE IN 12 R11 REEL P.
L:BRAKE DOWN BRAKE DOWN IN 13 R12 B.DOWN
H:CASSETTE IN CASSETTE SW A 14 R13 C.SW A
L:CASSETTE IN CASSETTE SW B 15 R14 C.SW B
H:EJECT EJECT SWITCH 16 R15 EJECT SW
ROTARY ENCODER DATA IN
17 K0 POS 1
18 K1 POS 2
19 K2 POS 3
20 K3 POS 4
L:ON REC POWER CONTROL 21 O0 REC
L:ON EE POWER CONTROL 22 O1 EE
L:ON PB POWER CONTROL 23 O2 PB
L:ON AL POWER CONTROL 24 O3 AL
CLOCK IN 25 EX
CLOCK OUT 26 X
L:RESET RESET TERMINAL 27 RESET
REFERENCE PULSE INPUT FOR QUASI V-SYNC 28 IRQ
GND 29 TC
SERIAL CLOCK IN FROM OPERATION IC(MB88551) 30 SC
SERIAL DATA IN FROM OPERATION IC(MB88551) 31 SI
GND 32 VSS
VCC VCC 64 VCC(IDL 5V)
START 63
NC 62 NC
STOP P 3 61 DRUM MOTOR STOP H:STOP
STILL P 2 60 STILL CONTROL H:STILL
VSC-1 P 1 59 CAPSTAN MOTOR TORUQE CONT. 1 0 PLAY /REC, 0 0 STILL /STOP, 1 1 CUE/REVIEW F.FWD/REW
VSC-0 P 0 58
SW.P E23 57 SWITCHING PULSE IN
SP,LP/SLP E22 56 TAPE SPEED SELECT 0 0 SP (2H), 0 1 LP (4H), 1 1 SLP (6H)
SP/LP,SLP E21 55
E20 54 NC
REC SP/SLP E19 53 RECORDING TAPE SPEED SELECT L:SLP,H:SP
SERVO E18 52 SERVO CONTROL L:PLAY,REC,CUE,REVIEW
CM FWD E17 51 CAPSTAN MOTOR CONT 0 1 FWD, 1 0 REV, 1 1 STOP
CM REV E16 50
PAL/NT E15 49 PAL/NTSC SELECT L:NTSC, H:PAL
TEST 1 E14 48
TEST 2 E13 47 NC
3 HEAD E12 46
V.F.P E11 45 VIDEO FRONT PULSE OUT
TV/VIDEO E10 44 ANNTENA SELECT L:VIDEO,H:TV
LED
REC E9 43
PLAY E8 42
REW E7 41
VIDEO E6 40
SLP E5 39
SP E4 38
TIMER E3 37
F.FWD E2 36
FUNCTION LED CONTROL
PAUSE E1 35 NC
T.MUTE E0 34 TUNER MUTE CONTROL
SO 33 SERIAL DATA OUT FOROPERATION IC(MB88525)

VS-X9EGN

＊ Thermistor TH1 serves to prevent the breakdown of D1 or blowing of the fuse caused by an inrush current in a C3 charging mode.


AC110 to 240V
50/60Hz
D1
＊ TH1
C3
TR1, 2
SWITCHING CIRCUIT
T1
1
2
3
4
9
8
7
6
5
SF2
TR6, 7
REG.
IDL12V
F2
REG16V
FR2
REG40V
FR3
REG 6V
SF1
TR5
IC1
REG.
IDL5V
TR3
CONTROL
PH1
TR4
CONTROL
TR9
H:ON
DM STOP
TH701
DRUM HEATER
TR8
DM STOP:ON
PRIMARY CIRCUIT
SECONDARY CIRCUIT

＊ The primary and secondary circuit grounds have been isolated from each other, so that due caution will be required especially when testing the primary circuit.

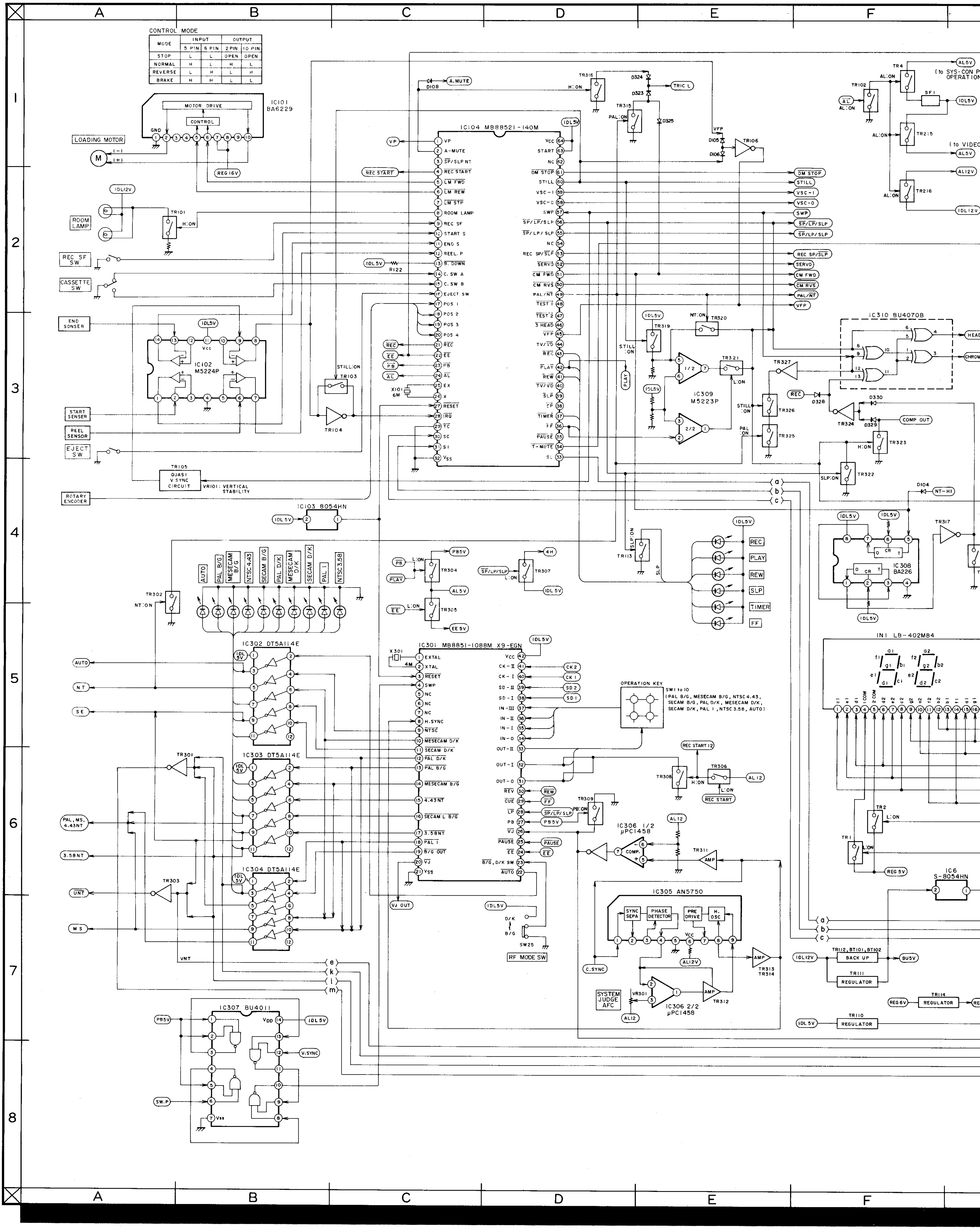

VIF UNIT Pin⑧
RF CONVERTER Pin⑤
OUT
AUDIO
J2
IN
EE
IC251 BA5115
A-MUTE
18
17
16
15
14
13
12
11
10
ALC
BUFF
BUFF
SW
LINE
P.B
REC
Vcc
1
2
3
4
5
6
7
8
9
EQ
EQ
VR252
PAL AUDIO LEVEL
SP.LP/SLP
TR256
SLP:ON
TR255
SLP:ON
TR253
SLP:ON
TR254
PAL/NT
PAL:ON
IC252 μPC1513HA
Vcc
1
2
3
4
5
6
7
TR257
H:ON
REC
EE
P251
P.B
REC
AUDIO REC/P.B HEAD
TR252
ALI2V
L:ON
TR251, FR251
AUDIO REC BIAS OSC
VR251
AUDIO REC BIAS
SE
SIDE ERASE HEAD
P252
FE
FULL ERASE HEAD
D261
TR109
H:ON
TR108
L:ON
REC START
TR107
L:ON
REC SF SW
IDL5V

VS-X9EGN
POWER
BLOCK DIAGRAM

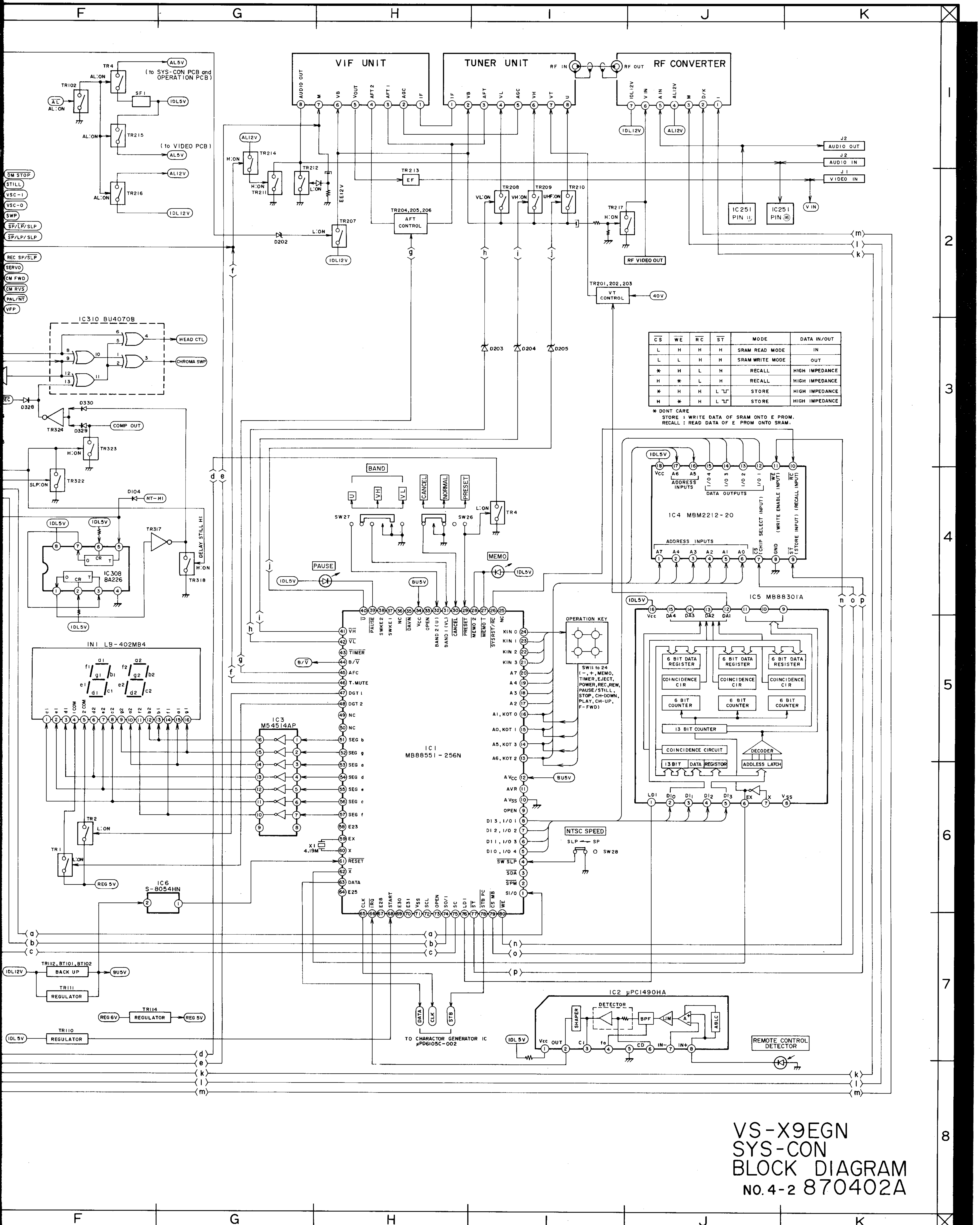
VS-X9EGN
AUDIO
BLOCK DIAGRAM
NO. 4-1 870401A

CONTROL MODE

MODE	INPUT		OUTPUT	
	5 PIN	6 PIN	2 PIN	10 PIN
STOP	L	L	OPEN	OPEN
NORMAL	H	L	H	L
REVERSE	L	H	L	H
BRAKE	H	H	L	L



A
B
C
D
E
F
1
2
3
4
5
6
7
8
IC101 BA6229
MOTOR DRIVE
CONTROL
GND
LOADING MOTOR
M
(−)
(+)
REG 16V
IDL12V
ROOM LAMP
TR101
H:ON
REC SF SW
CASSETTE SW
END SONSER
IDL5V
Vcc
IC102 M5224P
START SENSER
REEL SENSOR
EJECT SW
TR105 QUASI V SYNC CIRCUIT
VR101: VERTICAL STABILITY
ROTARY ENCODER
IC103 8054HN
IC104 MB88521-140M
VP
A-MUTE
SP/SLP NT
REC START
LM FWD
LM REW
LM STP
ROOM LAMP
REC SF
START S
END S
REEL. P
B. DOWN
C. SW A
C. SW B
EJECT SW
POS 1
POS 2
POS 3
POS 4
REC
EE
PB
AL
EX
X
RESET
IRQ
TC
SC
SI
VSS
X101 6M
R122
Vcc
START
NC
DM STOP
STILL
VSC-1
VSC-0
SWP
SP/LP/SLP
REC SP/SLP
SERVO
CM FWD
CM RVS
PAL/NT
TEST 1
TEST 2
3 HEAD
VFP
TV/VD
FLAY
REW
SLP
CP
TIMER
FF
PAUSE
T-MUTE
SO
D108
A.MUTE
TR103
STILL:ON
TR104
TR316
H:ON
D324
D323
TRIC L
TR315
PAL:ON
D325
D105
D106
TR106
TR319
STILL:ON
NT:ON
TR320
TR321
L:ON
IC309 M5223P
1/2
2/2
PLAY
TR327
STILL:ON
TR326
PAL:ON
TR325
REC
D328
D330
TR324
D329
COMP. OUT
H:ON
TR323
SLP:ON
TR322
D104
NT-HI
IC310 BU4070B
HEAD
CHROM
TR4
AL:ON
(to SYS-CON P OPERATION)
AL5V
TR102
AL
SF1
TR215
(to VIDEO)
ALI2V
TR216
IDL12V
TR317
IC308 BA226
CR
IN1 LB-402MB4
g1 f1 b1 e1 d1 c1
g2 f2 b2 e2 d2 c2
TR113
SLP:ON
TR302
NT:ON
AUTO
PAL B/G
MESECAM B/G
NTSC 4.43
SECAM B/G
PAL D/K
MESECAM D/K
SECAM D/K
PAL I
NTSC 3.58
REC
PLAY
REW
SLP
TIMER
FF
PB
PLAY
L:ON
TR304
PB5V
AL5V
TR305
EE
EE 5V
SP/LP/SLP
TR307
4H
IC302 DT5A114E
IC303 DT5A114E
IC304 DT5A114E
AUTO
NT
SE
PAL, MS, 4.43NT
3.58NT
UNT
MS
TR301
TR303
VNT
IC301 MB8851-1088M X9-EGN
X301
4M
EXTAL
XTAL
RESET
SWP
NC
H.SYNC
NTSC
MESECAM D/K
SECAM D/K
PAL D/K
PAL B/G
MESECAM B/G
4.43NT
SECAM L B/G
3.58NT
PAL I
B/G OUT
VJ
VSS
CK-II
CK-I
SD-II
SD-I
IN-III
IN-II
IN-I
IN-0
OUT-II
OUT-I
OUT-0
REV
CUE
LP
VJ
PAUSE
B/G, D/K SW
AUTO
CK2
CK1
SD2
SD1
OPERATION KEY
SW1 to 10 (PAL B/G, MESECAM B/G, NTSC 4.43, SECAM B/G, PAL D/K, MESECAM D/K, SECAM D/K, PAL I, NTSC 3.58, AUTO)
REC START 12
TR308
TR306
AL 12
REC START
TR309
PB:ON
IC306 1/2 μPC1458
COMP.
AL12
TR311
AMP
VJ OUT
D/K
B/G
SW25
RF MODE SW
IC305 AN5750
SYNC SEPA
PHASE DETECTOR
PRE DRIVE
H. OSC
C.SYNC
AL12V
TR313 TR314
SYSTEM JUDGE AFC
VR301
IC306 2/2 μPC1458
TR312
IC307 BU4011
VDD
VSS
V.SYNC
SW.P
TR2
TR1
REG 5V
IC6 S-8054HN
TR112, BT101, BT102 BACK UP
TR111 REGULATOR
BU5V
REG6V
TR114 REGULATOR
TR110 REGULATOR
a
b
c
e
k
l
m

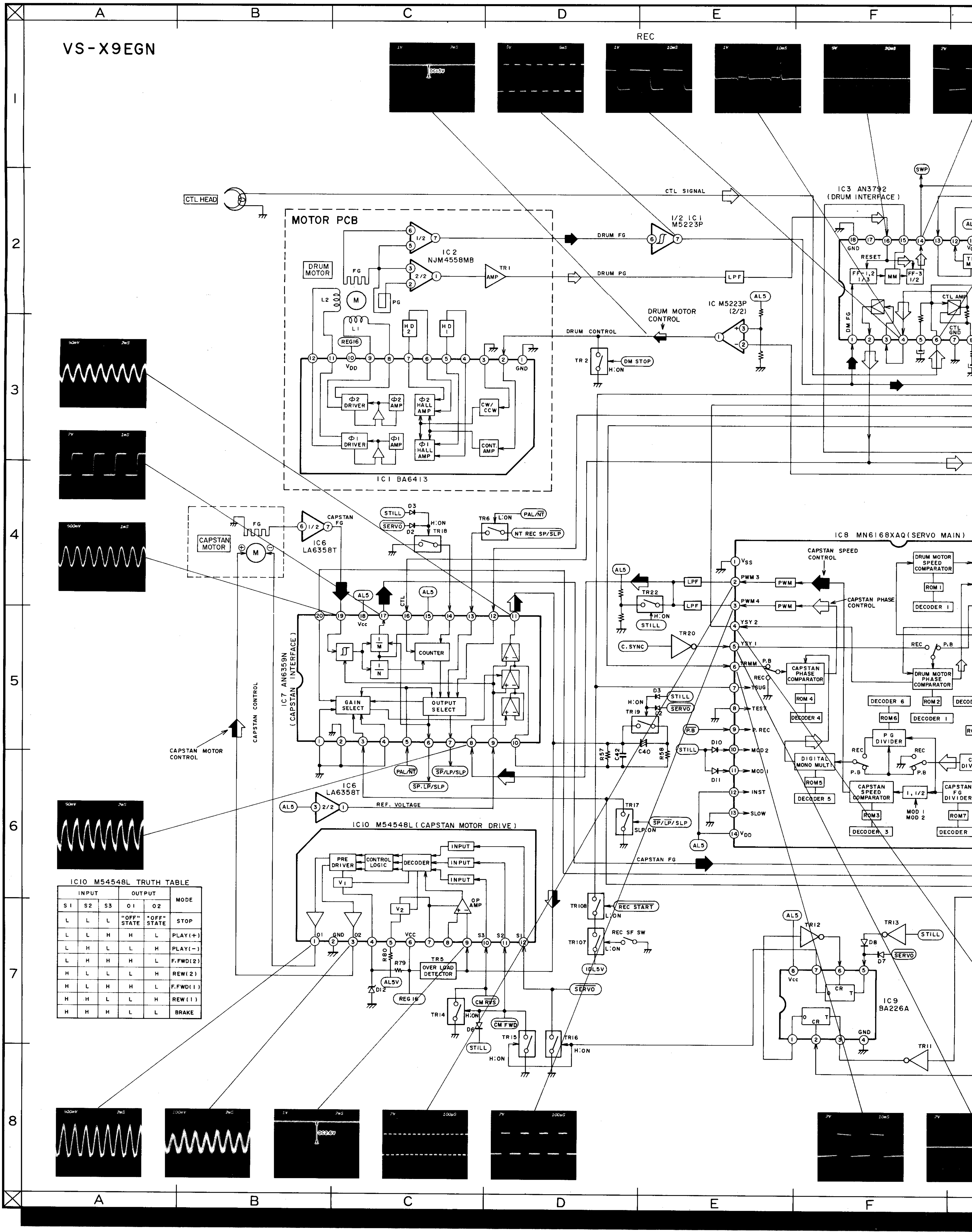

VIF UNIT
TUNER UNIT
RF CONVERTER
AUDIO OUT
VOUT
AFT 2
AFT 1
AGC
IF
RF IN
RF OUT
IDL12V
AL12V
AL5V
IDL5V
TR4
TR102
TR215
TR216
SF1
(to SYS-CON PCB and OPERATION PCB)
(to VIDEO PCB)
TR214
TR212
TR211
TR213
EF
TR207
D202
TR204,205,206
AFT CONTROL
TR208
TR209
TR210
TR217
RF VIDEO OUT
TR201,202,203
VT CONTROL
40V
J2 AUDIO OUT
J2 AUDIO IN
J1 VIDEO IN
IC251 PIN 11
IC251 PIN 16
VIN
D203
D204
D205
IC310 BU4070B
HEAD CTL
CHROMA SWP
D328
D330
D329
TR324
COMP OUT
TR323
TR322
D104
NT-HI
TR317
TR318
DELAY STILL HI
IC308 8A226
IN1 LB-402MB4
IC3 M54514AP
IC1 MB88551-256N
BAND
CANCEL
NORMAL
PRESET
SW27
SW26
PAUSE
MEMO
BU5V
OPERATION KEY
SW11 to 24 (-, +, MEMO, TIMER, EJECT, POWER, REC, REW, PAUSE/STILL, STOP, CH-DOWN, PLAY, CH-UP, F-FWD)
NTSC SPEED
SLP ← SP
SW28
IC4 MBM2212-20
ADDRESS INPUTS
DATA OUTPUTS
IC5 MB88301A
6 BIT DATA REGISTER
COINCIDENCE CIR
6 BIT COUNTER
13 BIT COUNTER
COINCIDENCE CIRCUIT
DECODER
ADDLESS LATCH
X1 4.19M
IC6 S-8054HN
REG 5V
TR2
TR1
TR112, BT101, BT102
BACK UP
TR111 REGULATOR
TR114 REGULATOR
REG 6V
TR110 REGULATOR
DATA
CLK
STB
TO CHARACTOR GENERATOR IC μPD6105C-002
IC2 μPC1490HA
SHAPER
DETECTOR
BPF
LIM
ABLC
REMOTE CONTROL DETECTOR

$\overline{CS}$	$\overline{WE}$	$\overline{RC}$	$\overline{ST}$	MODE	DATA IN/OUT
L	H	H	H	SRAM READ MODE	IN
L	L	H	H	SRAM WRITE MODE	OUT
*	H	L	H	RECALL	HIGH IMPEDANCE
H	*	L	H	RECALL	HIGH IMPEDANCE
*	H	H	L ⊔	STORE	HIGH IMPEDANCE
H	*	H	L ⊔	STORE	HIGH IMPEDANCE

* DONT CARE
STORE : WRITE DATA OF SRAM ONTO E PROM.
RECALL : READ DATA OF E PROM ONTO SRAM.

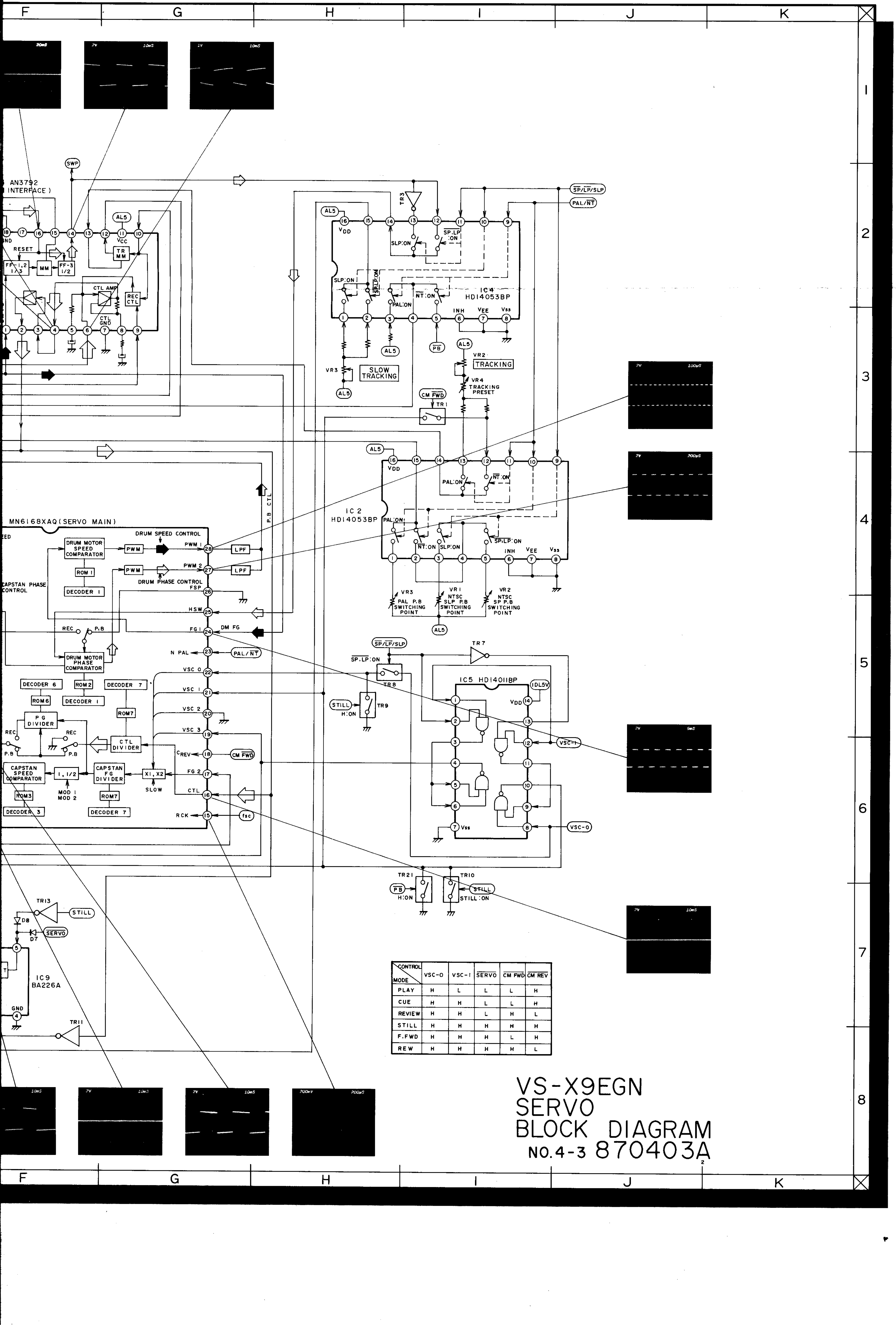
VS-X9EGN
SYS-CON
BLOCK DIAGRAM
NO. 4-2 870402A

VS-X9EGN


A
B
C
D
E
F
1
2
3
4
5
6
7
8
REC
DC1.5V
DC2.6V
CTL HEAD
CTL SIGNAL
MOTOR PCB
DRUM MOTOR
FG
PG
IC2 NJM4558MB
TR1
AMP
DRUM FG
DRUM PG
1/2 IC1 M5223P
LPF
IC3 AN3792 (DRUM INTERFACE)
SWP
RESET
FF-1,2 1/3
MM
FF-3 1/2
CTL AMP
CTL GND
DM FG
GND
L1
L2
HD 2
HD 1
REG16
VDD
Φ2 DRIVER
Φ2 AMP
Φ2 HALL AMP
Φ1 DRIVER
Φ1 AMP
Φ1 HALL AMP
CW/CCW
CONT. AMP
IC1 BA6413
DRUM CONTROL
DRUM MOTOR CONTROL
IC M5223P (2/2)
AL5
TR2
DM STOP
H:ON
CAPSTAN MOTOR
CAPSTAN FG
IC6 LA6358T
STILL
SERVO
D3
D2
TR18
TR6
L:ON
PAL/NT
NT REC SP/SLP
CTL
Vcc
COUNTER
GAIN SELECT
OUTPUT SELECT
IC7 AN6359N (CAPSTAN INTERFACE)
CAPSTAN CONTROL
CAPSTAN MOTOR CONTROL
SP.LP/SLP
SP/LP/SLP
REF. VOLTAGE
IC10 M54548L (CAPSTAN MOTOR DRIVE)
PRE DRIVER
CONTROL LOGIC
DECODER
INPUT
V1
V2
OP AMP
O1
O2
S1
S2
S3
R80
R79
TR5
OVER LOAD DETECTOR
AL5V
D12
REG 16
TR14
CM RVS
CM FWD
D6
TR15
TR16
IC8 MN6168XAQ (SERVO MAIN)
VSS
PWM 3
PWM 4
YSY 2
YSY 1
RMM
TSUG
TEST
P.REC
MOD 2
MOD 1
INST
SLOW
VDD
CAPSTAN SPEED CONTROL
CAPSTAN PHASE CONTROL
PWM
TR22
TR20
C. SYNC
P.B
CAPSTAN PHASE COMPARATOR
ROM 4
DECODER 4
TR19
R57
C42
C40
R58
D10
D11
DIGITAL MONO MULT
ROM5
DECODER 5
DRUM MOTOR SPEED COMPARATOR
ROM 1
DECODER 1
DRUM MOTOR PHASE COMPARATOR
DECODER 6
ROM2
ROM6
PG DIVIDER
CAPSTAN SPEED COMPARATOR
ROM3
DECODER 3
1, 1/2
MOD 1
MOD 2
CAPSTAN FG DIVIDER
ROM7
TR17
SLP ON
TR108
REC START
TR107
REC SF SW
IDL5V
TR12
TR13
D8
D7
IC9 BA226A
CR
TR11

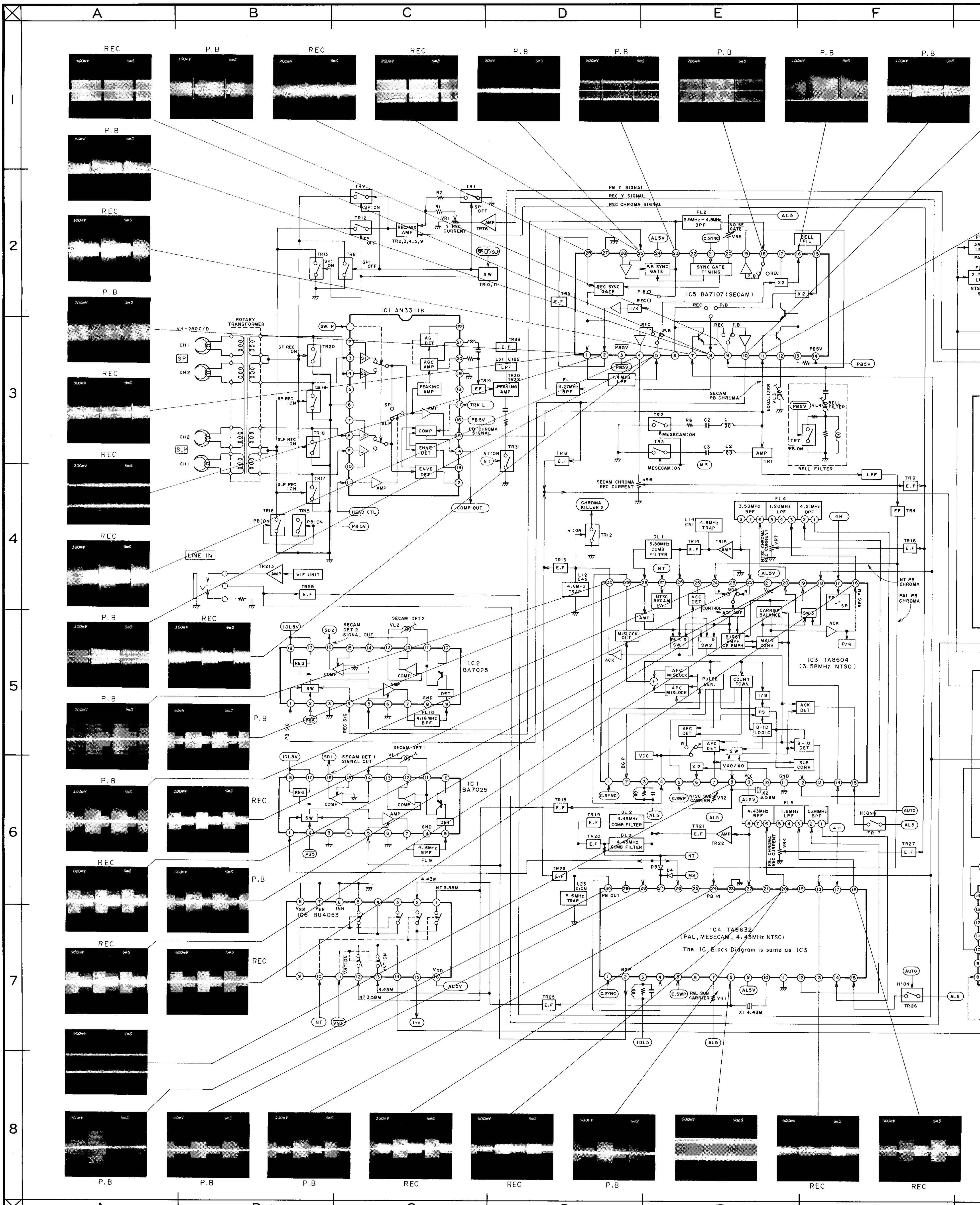
IC10 M54548L TRUTH TABLE

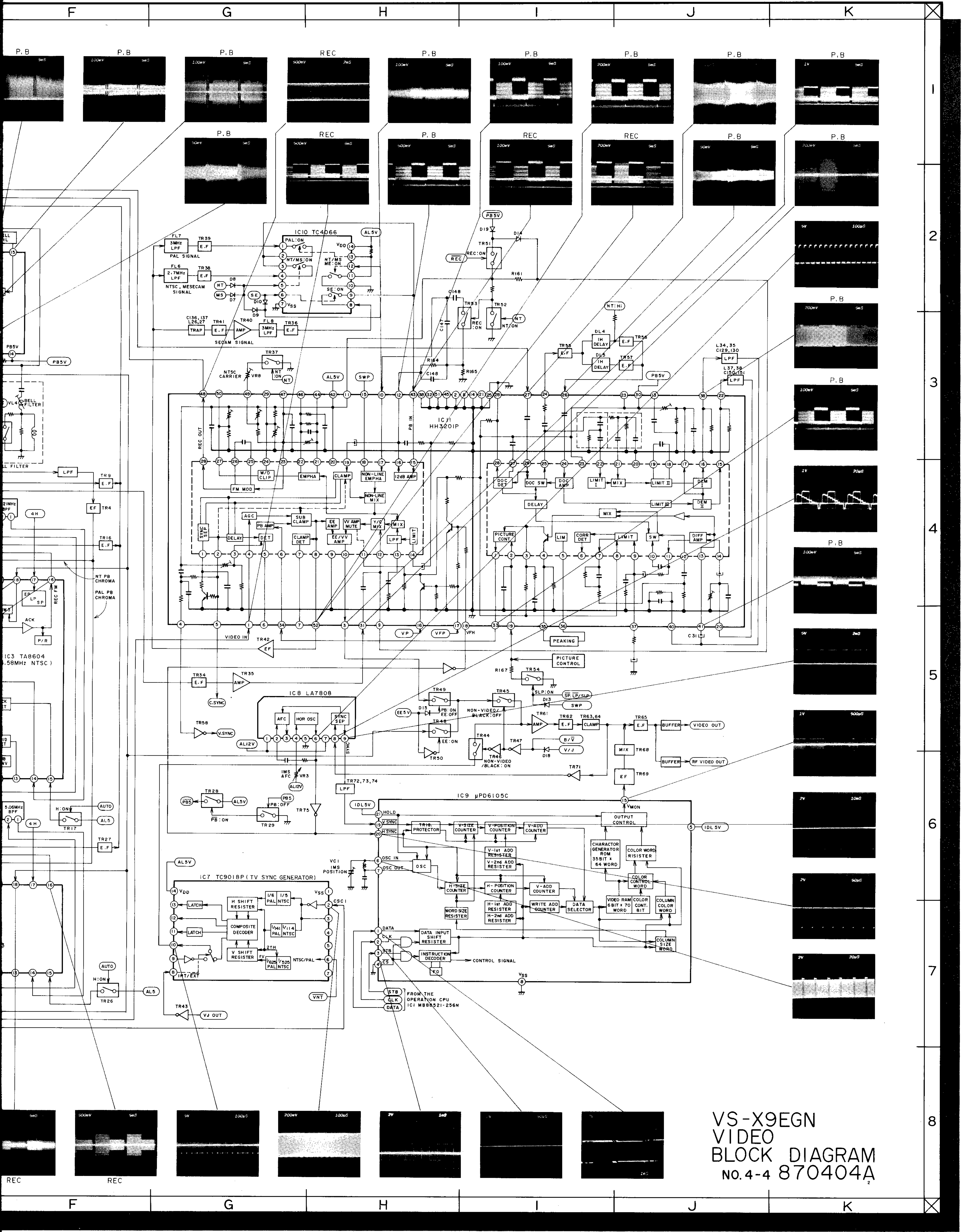
INPUT			OUTPUT		MODE
S1	S2	S3	O1	O2	
L	L	L	"OFF" STATE	"OFF" STATE	STOP
L	L	H	H	L	PLAY(+)
L	H	L	L	H	PLAY(−)
L	H	H	H	L	F.FWD(2)
H	L	L	L	H	REW(2)
H	L	H	H	L	F.FWD(1)
H	H	L	L	H	REW(1)
H	H	H	L	L	BRAKE


F
G
H
I
J
K
1
2
3
4
5
6
7
8
20mS
1V 10mS
1V 10mS
SWP
AN3792
INTERFACE)
RESET
FF-1,2 1/3
MM
FF-3 1/2
TR MM
AL5
VCC
CTL AMP
REC CTL
CTL GND
GND
TR3
AL5
VDD
SLP:ON
SP.LP :ON
SLP:ON
SP.LP:ON
PAL:ON
NT:ON
IC4 HD14053BP
INH
VEE
Vss
SP/LP/SLP
PAL/NT
VR3
SLOW TRACKING
AL5
PB
VR2
TRACKING
VR4 TRACKING PRESET
CM FWD
TR1
2V 100µS
2V 200µS
AL5
VDD
PAL:ON
NT:ON
IC 2 HD14053BP
PAL:ON
NT:ON
SLP:ON
SP.LP:ON
INH
VEE
Vss
VR3 PAL P.B SWITCHING POINT
VR1 NTSC SLP P.B SWITCHING POINT
VR2 NTSC SP P.B SWITCHING POINT
AL5
P.B CTL
MN6168XAQ(SERVO MAIN)
EED
DRUM SPEED CONTROL
DRUM MOTOR SPEED COMPARATOR
PWM
PWM 1
LPF
ROM 1
PWM
PWM 2
LPF
DECODER 1
DRUM PHASE CONTROL
CAPSTAN PHASE CONTROL
FSP
HSW
REC
P.B
FG 1
DM FG
DRUM MOTOR PHASE COMPARATOR
N PAL
PAL/NT
VSC 0
VSC 1
VSC 2
VSC 3
DECODER 6
ROM 2
DECODER 7
ROM 6
DECODER 1
ROM7
P G DIVIDER
REC
REC
P.B
P.B
CTL DIVIDER
CREV
CM FWD
CAPSTAN SPEED COMPARATOR
1, 1/2
CAPSTAN FG DIVIDER
X1, X2
FG 2
SLOW
MOD 1 MOD 2
CTL
ROM3
ROM7
DECODER 3
DECODER 7
RCK
fsc
SP/LP/SLP
SP.LP:ON
TR7
TR8
STILL
H:ON
TR9
IC5 HD14011BP
IDL5V
VDD
VSC-1
Vss
VSC-0
2V 5mS
TR21
PB
H:ON
TR10
STILL
STILL:ON
2V 10mS
TR13
STILL
D8
D7
SERVO
IC9 BA226A
GND
TR11
10mS
2V 10mS
2V 10mS
200mV 200µS

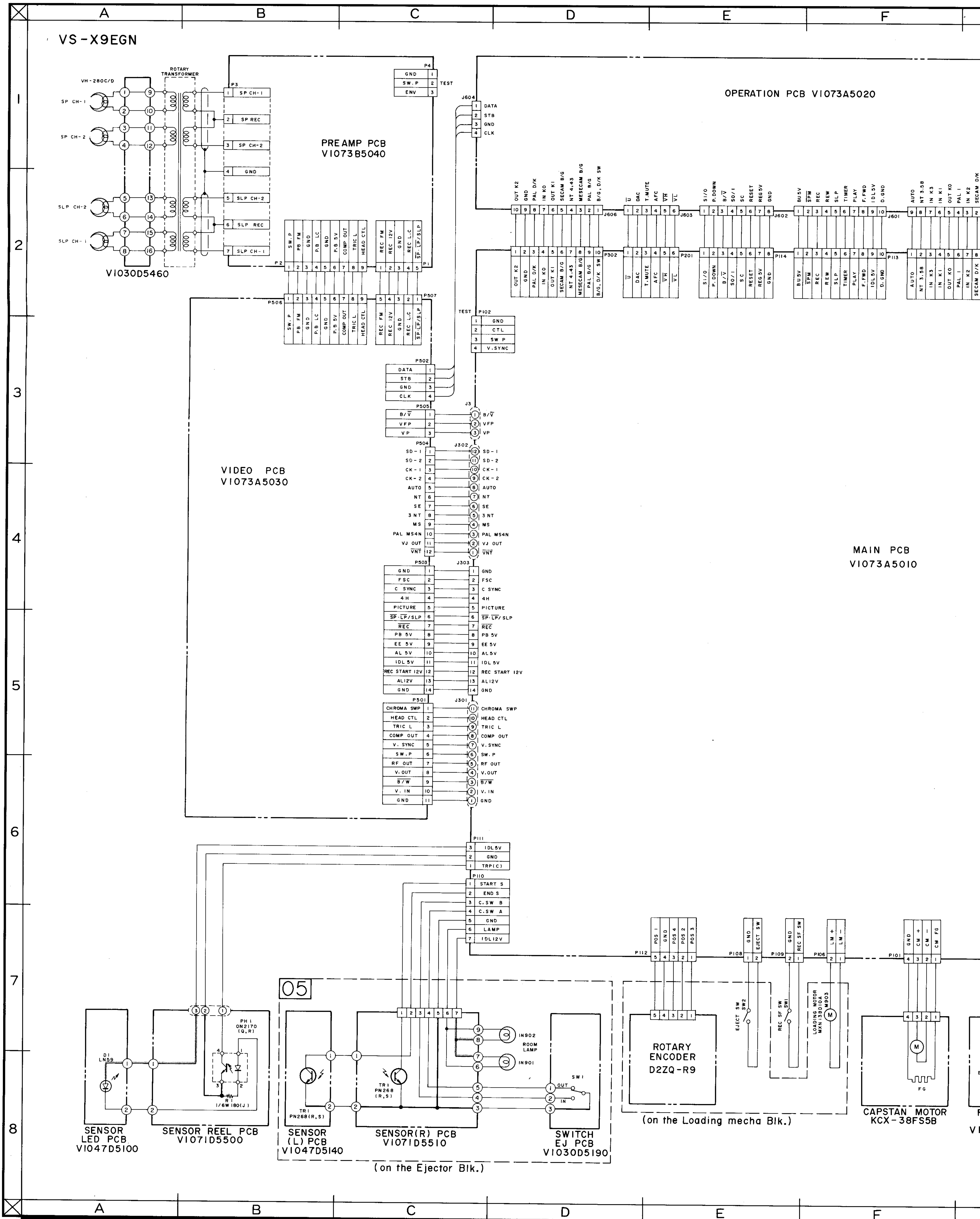
CONTROL / MODE	VSC-O	VSC-1	$\overline{\text{SERVO}}$	$\overline{\text{CM FWD}}$	$\overline{\text{CM REV}}$
PLAY	H	L	L	L	H
CUE	H	H	L	L	H
REVIEW	H	H	L	H	L
STILL	H	H	H	H	H
F.FWD	H	H	H	L	H
REW	H	H	H	H	L

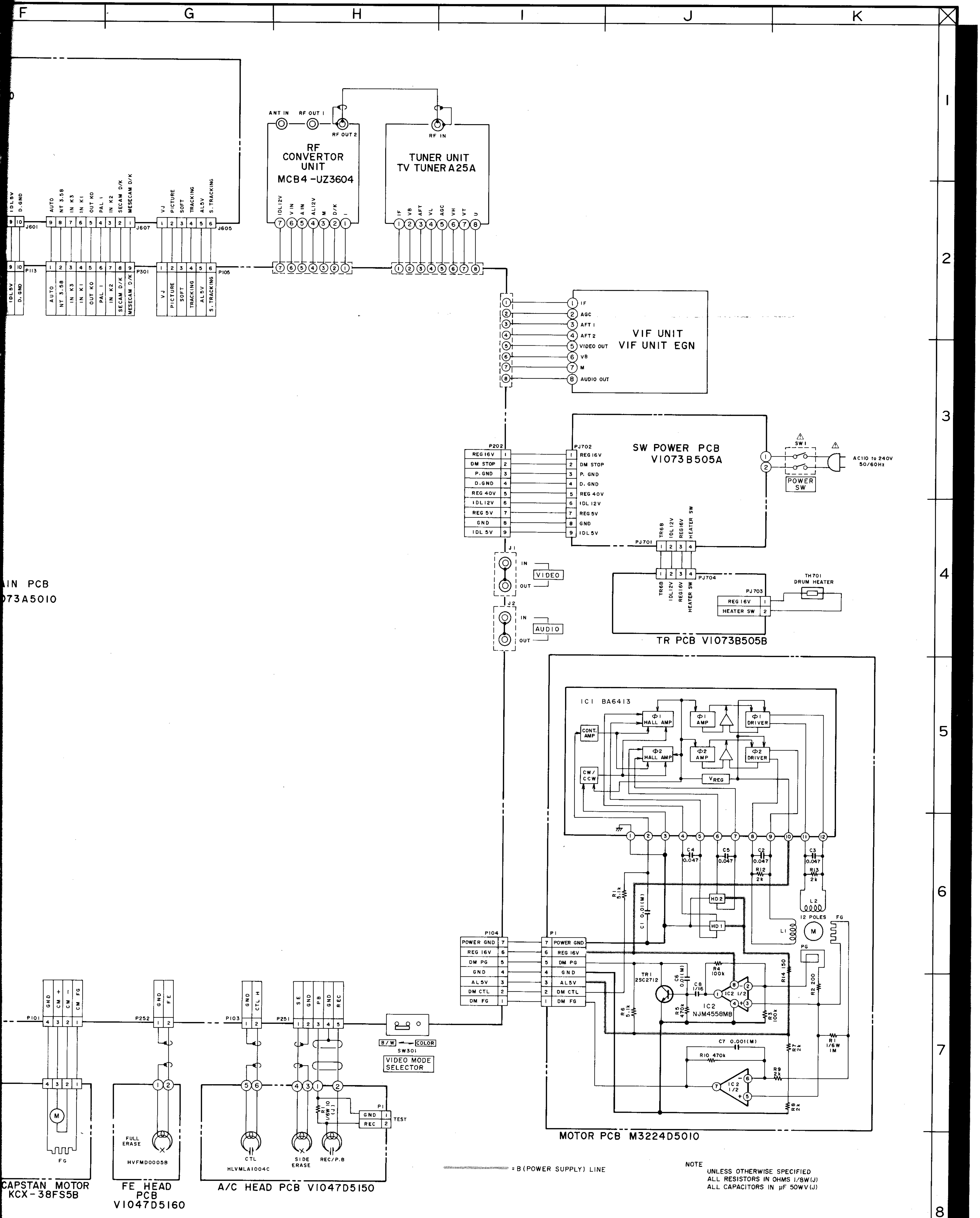
VS-X9EGN
SERVO
BLOCK DIAGRAM
NO.4-3 870403A
2

A
B
C
D
E
F
1
2
3
4
5
6
7
8
REC
P.B
VH-280C/D
ROTARY TRANSFORMER
CH1
CH2
SP
SLP
SP REC :ON
SLP REC :ON
PB:ON
TR7
TR12
TR13
TR8
TR1
TR76
SP:ON
SP:OFF
REC/MIX AMP
TR2,3,4,5,9
R2
R1
VR1
Y REC CURRENT
AMP
SP LP/SLP
SW
TR10,11
TR20
TR19
TR18
TR17
TR16
TR15
HEAD CTL
PB 5V
LINE IN
TR213
VIF UNIT
TR59
E.F
IC1 AN3311K
SW.P
AG DET
AGC AMP
PEAKING AMP
COMP
ENVE DET
TRK L
PB 5V
PB CHROMA SIGNAL
COMP OUT
TR33
L31 C122
LPF
EF
TR14
TR30 TR32
TR31
NT:ON
NT
PB Y SIGNAL
REC Y SIGNAL
REC CHROMA SIGNAL
FL2
3.9MHz - 4.6MHz BPF
AL5
AL5V
C.SYNC
NOISE GATE
VR5
BELL FIL
P.B SYNC GATE
SYNC GATE TIMING
REC SYNC GATE
IC5 BA7107 (SECAM)
X2
1/4
TR5
PB5V
P85V
FL1
4.27MHz BPF
1.4MHz LPF
SECAM PB CHROMA
EQUALIZER VL3
BELL FILTER
VL4
TR7
PB:ON
TR2
R6
C2
L1
MESECAM:ON
TR3
C3
L2
MS
TR1
TR8
SECAM CHROMA REC CURRENT
VR6
LPF
TR9
TR4
CHROMA KILLER 2
H:ON
TR12
IDL5V
SD2
SECAM DET 2 SIGNAL OUT
SECAM DET2
VL2
REG
IC2 BA7025
DET
GND
FL10
4.16MHz BPF
PB SIG
REC SIG
PB5
SD1
SECAM DET 1 SIGNAL OUT
SECAM DET1
VL1
IC1 BA7025
4.16MHz BPF
FL9
IC6 BU4053
VSS
VEE
INH
4.43M
NT 3.58M
VDD
VNT:ON
AL5V
fsc
VNT
L14 C51
4.8MHz TRAP
DL1
3.58MHz COMB FILTER
TR15
FL4
3.58MHz BPF
1.20MHz LPF
4.21MHz BPF
4H
NTSC CHROMA REC CURRENT
VR7
TR16
NT PB CHROMA
PAL PB CHROMA
TR13
L12 C42
4.8MHz TRAP
NTSC SECAM PAL
ACC DET
CONTROL
ACC AMP
CARRIER BALANCE
SW3
LP SP
REC FM
ACK
P/R
MISLOCK OUT
PN S R SW1
SW2
BURST EMPH DE EMPH
MAIN CONV
IC3 TA8604 (3.58MHz NTSC)
AFC MISLOCK
APC MISLOCK
PULSE GEN.
COUNT DOWN
1/8
PS
ACK DET
B-ID LOGIC
AFC DET
APC DET
B-ID DET
VCO
VXO/XO
SUB CONV
BGP
C.SWP
NTSC SUB CARRIER
VR2
X2 3.58M
TR18
TR19
DL2
4.43MHz COMB FILTER
TR20
DL3
4.43MHz COMB FILTER
TR21
TR22
FL5
4.43MHz BPF
1.6MHz LPF
5.06MHz BPF
AUTO
TR17
PAL CHROMA REC CURRENT
VR4
TR27
D5
D4
TR23
L23 C106
5.6MHz TRAP
PB OUT
PB IN
IC4 TA8632
(PAL, MESECAM, 4.43MHz NTSC)
The IC Block Diagram is same as IC3
PAL SUB CARRIER
VR1
X1 4.43M
TR25
TR26
IDL5


F
G
H
I
J
K
1
2
3
4
5
6
7
8
P.B
REC
IC10 TC4066
PAL:ON
NT/MS:ON
NT/MS ME:ON
SE:ON
FL7 3MHz LPF
PAL SIGNAL
FL6 2.7MHz LPF
NTSC, MESECAM SIGNAL
TRAP
SECAM SIGNAL
FL8 3MHz LPF
NTSC CARRIER
BELL FILTER
IC11 HH3201P
REC OUT
PB IN
FM MOD
W/D CLIP
EMPHA
CLAMP
NON-LINE EMPHA
NON-LINE MIX
12dB AMP
SYNC SEP
AGC
DELAY
PB AMP
DET
SUB CLAMP
CLAMP DET
EE AMP
VV AMP MUTE
EE/VV AMP
Y/C MIX
MIX
LPF
LIMIT
DOC DET
DOC SW
DOC AMP
LIMIT I
LIMIT II
LIMIT III
DEM I
DEM II
PICTURE CONT
LIM
CORR DET
SW
DIFF AMP
1H DELAY
PEAKING
PICTURE CONTROL
VIDEO IN
IC3 TA8604
3.58MHz NTSC
NT PB CHROMA
PAL PB CHROMA
REC FM
ACK
P/R
5.06MHz BPF
IC8 LA7808
AFC
HOR OSC
SYNC SEP
IMS AFC
C.SYNC
V.SYNC
NON-VIDEO/BLACK:OFF
NON-VIDEO/BLACK:ON
EE:ON
PB:ON EE:OFF
SLP:ON
SP, LP/SLP
SWP
BUFFER
VIDEO OUT
RF VIDEO OUT
IC9 μPD6105C
HOLD
V.SYNC
H.SYNC
TRIG. PROTECTOR
V-SIZE COUNTER
V-POSITION COUNTER
V-ADD COUNTER
V-1st ADD RESISTER
V-2nd ADD RESISTER
OUTPUT CONTROL
CHARACTOR GENERATOR ROM 35BIT x 64 WORD
COLOR WORD RISISTER
COLOR CONTROL WORD
VIDEO RAM 6BIT x 70 WORD
COLOR CONT. BIT
COLUMN COLOR WORD
COLUMN SIZE WORD
OSC IN
OSC OUT
OSC
H-SIZE COUNTER
H-POSITION COUNTER
H-1st ADD RESISTER
H-2nd ADD RESISTER
WORD SIZE RESISTER
WRITE ADD COUNTER
DATA SELECTOR
DATA INPUT SHIFT RESISTER
INSTRUCTION DECODER
CONTROL SIGNAL
FROM THE OPERATION CPU IC1 MB88521-256N
IC7 TC9018P (TV SYNC GENERATOR)
H SHIFT RESISTER
COMPOSITE DECODER
V SHIFT RESISTER
LATCH
1/6 PAL
1/5 NTSC
INT/EXT
NTSC/PAL
VJ OUT
VNT
AL5V
PB5V
AL12V
IDL5V
AUTO
H:ON

VS-X9EGN
VIDEO
BLOCK DIAGRAM
NO.4-4 870404A


A
B
C
D
E
F
1
2
3
4
5
6
7
8
VS-X9EGN
VH-280C/D
ROTARY TRANSFORMER
SP CH-1
SP CH-2
SLP CH-2
SLP CH-1
V1030D5460
P3
SP CH-1
SP REC
SP CH-2
GND
SLP CH-2
SLP REC
SLP CH-1
P4
GND
SW.P
ENV
TEST
PREAMP PCB
V1073B5040
P2
SW.P
PB FM
GND
P.B LC
GND
P.B 5V
COMP OUT
TRIC L
HEAD CTL
P1
REC FM
REC 12V
GND
REC L.C
SP·LP/SLP
P506
P507
J604
DATA
STB
GND
CLK
OPERATION PCB V1073A5020
J606
OUT K2
GND
PAL D/K
IN K0
OUT K1
SECAM B/G
NT 4.43
MESECAM B/G
PAL B/G
B/G, D/K SW
J603
U
DAC
T.MUTE
AFC
VH
VL
J602
S1/0
P.DOWN
B/V
S0/1
SC
RESET
REG 5V
GND
J601
BU5V
SPM
REC
REW
SLP
TIMER
PLAY
F.FWD
IDL5V
D.GND
AUTO
NT 3.58
IN K3
IN K1
OUT K0
PAL I
IN K2
SECAM D/K
P302
P201
P114
P113
TEST
P102
GND
CTL
SW P
V.SYNC
P502
DATA
STB
GND
CLK
P505
J3
B/V
VFP
VP
P504
J302
SD-1
SD-2
CK-1
CK-2
AUTO
NT
SE
3 NT
MS
PAL MS4N
VJ OUT
VNT
VIDEO PCB
V1073A5030
P503
J303
GND
FSC
C SYNC
4H
PICTURE
SP·LP/SLP
REC
PB 5V
EE 5V
AL 5V
IDL 5V
REC START 12V
AL12V
GND
P501
J301
CHROMA SWP
HEAD CTL
TRIC L
COMP OUT
V. SYNC
SW.P
RF OUT
V. OUT
B/W
V. IN
GND
MAIN PCB
V1073A5010
P111
IDL5V
GND
TRP(C)
P110
START S
END S
C.SW B
C.SW A
GND
LAMP
IDL12V
P112
POS 1
GND
POS 4
POS 2
POS 3
P108
GND
EJECT SW
P109
GND
REC SF SW
P106
LM +
LM −
P101
GND
CM +
CM −
CM FG
05
D1
LN59
PH1
ON2170
(Q,R)
R1
1/6W 180(J)
SENSOR
LED PCB
V1047D5100
SENSOR REEL PCB
V1071D5500
TR1
PN268(R,S)
SENSOR
(L) PCB
V1047D5140
TR1
PN268
(R,S)
SENSOR(R) PCB
V1071D5510
IN902
ROOM
LAMP
IN901
SW1
OUT
IN
SWITCH
EJ PCB
V1030D5190
(on the Ejector Blk.)
ROTARY
ENCODER
D2ZQ-R9
EJECT SW
SW2
REC SF SW
SW1
LOADING MOTOR
MXN 13BD10A
M903
M
(on the Loading mecha Blk.)
M
FG
CAPSTAN MOTOR
KCX-38FS5B


F
G
H
I
J
K
1
2
3
4
5
6
7
8
IDL5V
D.GND
J601
AUTO
NT 3.58
IN K3
IN K1
OUT K0
PAL I
IN K2
SECAM D/K
MESECAM D/K
J607
VJ
PICTURE
SOFT
TRACKING
AL5V
S.TRACKING
J605
P113
P301
P105
ANT IN
RF OUT 1
RF OUT 2
RF CONVERTOR UNIT
MCB4-UZ3604
IDL12V
V IN
A IN
AL12V
M
D/K
I
RF IN
TUNER UNIT
TV TUNER A25A
IF
VB
AFT
VL
AGC
VH
VT
U
IF
AGC
AFT 1
AFT 2
VIDEO OUT
VB
M
AUDIO OUT
VIF UNIT
VIF UNIT EGN
P202
REG16V
DM STOP
P.GND
D.GND
REG 40V
IDL12V
REG 5V
GND
IDL 5V
PJ702
SW POWER PCB
V1073B505A
SW1
AC110 to 240V 50/60Hz
POWER SW
PJ701
TR68
IDL12V
REG16V
HEATER SW
PJ704
PJ703
TH701
DRUM HEATER
REG 16V
HEATER SW
TR PCB V1073B505B
J1
IN
OUT
VIDEO
J2
AUDIO
IN PCB
73A5010
IC1 BA6413
CONT. AMP
Φ1 HALL AMP
Φ1 AMP
Φ1 DRIVER
Φ2 HALL AMP
Φ2 AMP
Φ2 DRIVER
CW/CCW
VREG
C4 0.047
C5 0.047
C2 0.047
C3 0.047
R12 2k
R13 2k
L2
12 POLES
M
FG
R1 5.1k
C1 0.01(M)
HD2
HD1
L1
PG
P104
P1
POWER GND
REG 16V
DM PG
GND
AL5V
DM CTL
DM FG
TR1 2SC2712
C6 0.01(M)
C8 1/16
R4 100k
IC2 1/2
IC2 NJM4558MB
R5 470k
R6 5.1k
R3 100k
R14 150
R2 200
C7 0.001(M)
R10 470k
R7 2k
R9 2k
R8 2k
R1 1/6W 1M
MOTOR PCB M3224D5010
P101
GND
CM +
CM -
CM FG
P252
GND
FE
P103
GND
CTL H
P251
SE
GND
PB
GND
REC
B/W
COLOR
SW301
VIDEO MODE SELECTOR
M
FG
CAPSTAN MOTOR
KCX-38FS5B
FULL ERASE
HVFMD0005B
FE HEAD PCB
V1047D5160
CTL
HLVMLA1004C
SIDE ERASE
REC/P.B
R1 1/6W 10 (J)
P1
GND
REC
TEST
A/C HEAD PCB V1047D5150

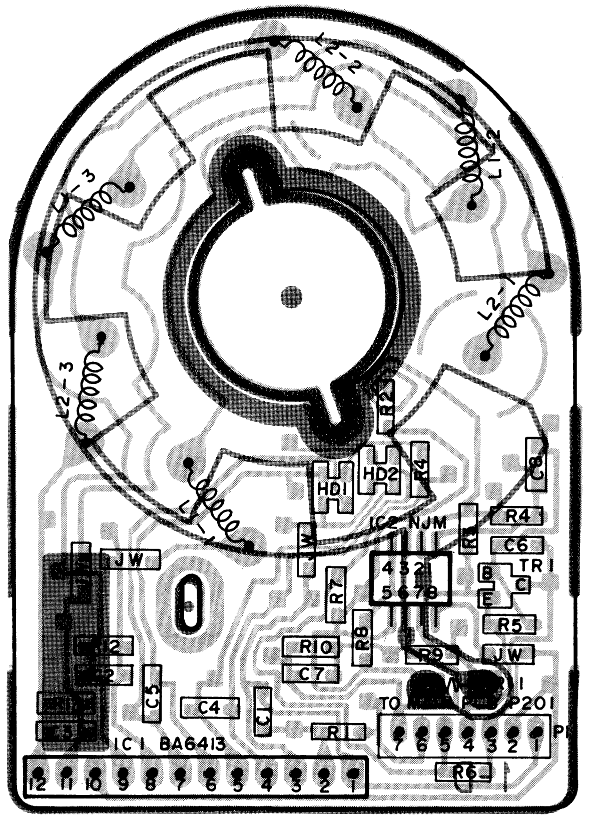
═══ = B (POWER SUPPLY) LINE

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/8W(J)
ALL CAPACITORS IN µF 50WV(J)

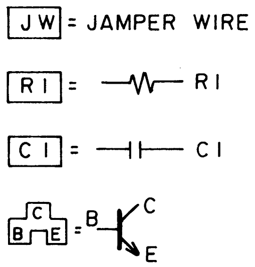
WARNING ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.
REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

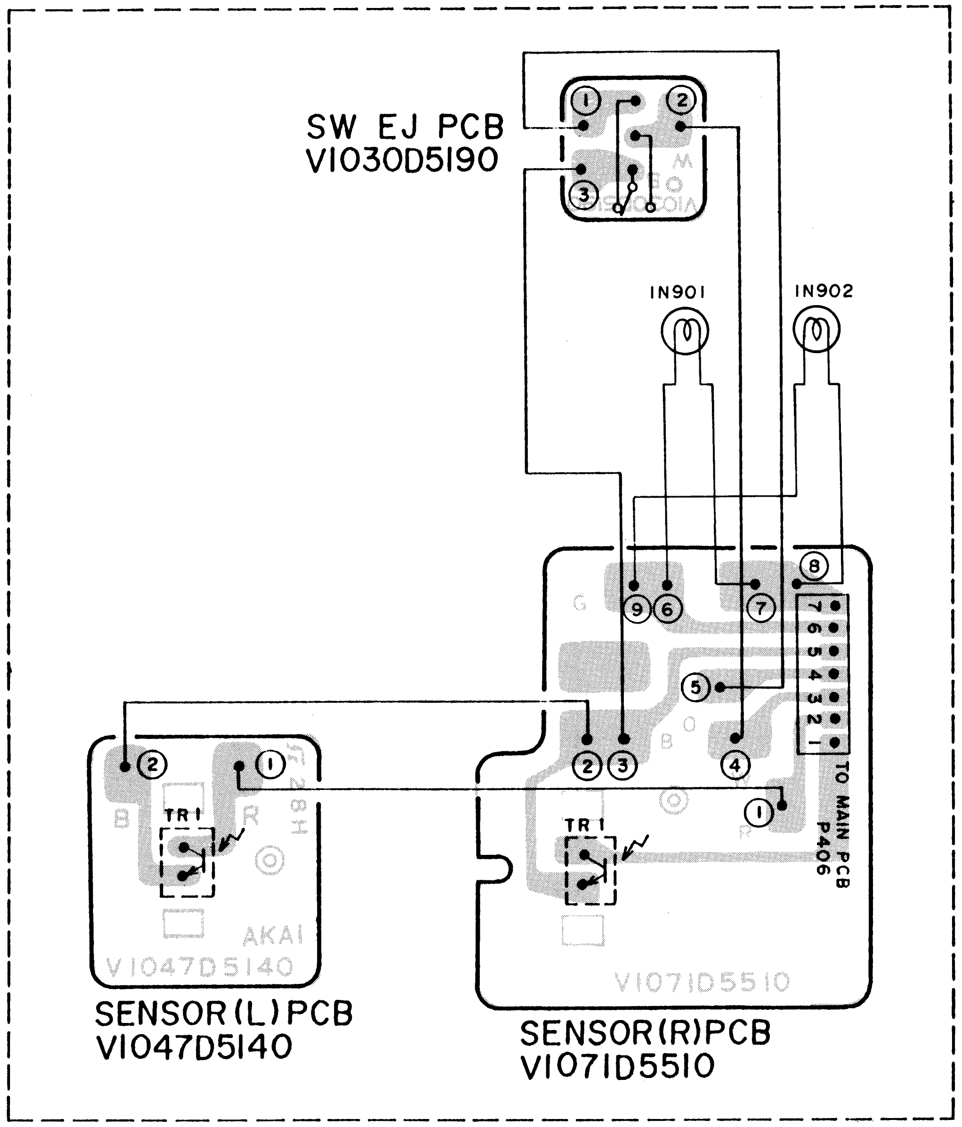
AVERTISSEMENT. ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE.
POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL.
NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

VS-X9EGN
CONNECTION DIAGRAM
NO. 7-1 870405A

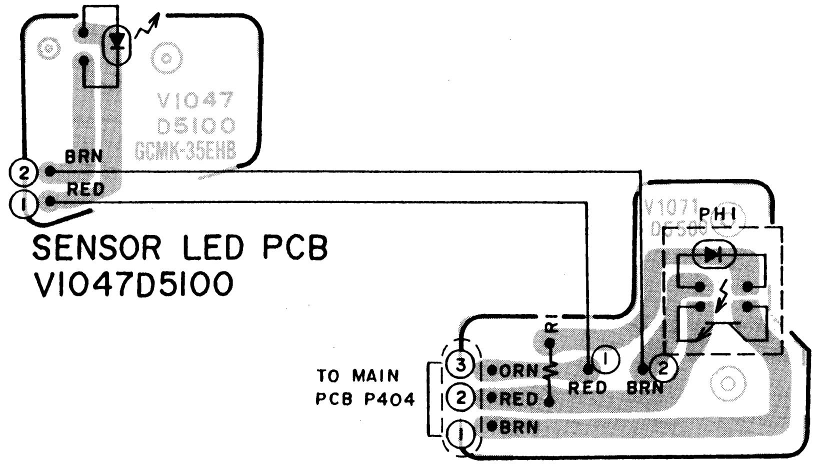

L2-2
L1-2
L1-3
L2-1
L2-3
L1-1
HD1
HD2
R2
R3
R4
C8
IC2 NJM
TR1
R5
JW
R6
R7
R8
R9
R10
C7
C4
C5
C1
R1
IC1 BA6413
TO MAIN PCB P201
12 11 10 9 8 7 6 5 4 3 2 1
7 6 5 4 3 2 1

MOTOR PCB M3224D5010(SM-240)


JW = JAMPER WIRE
R1 = R1
C1 = C1
C B E = B C E

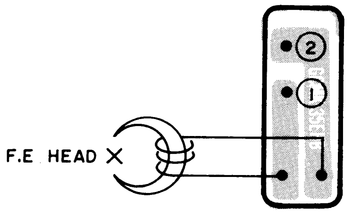

SW EJ PCB
V1030D5190
IN901
IN902
SENSOR(L)PCB
V1047D5140
SENSOR(R)PCB
V1071D5510
TR1
TR1
AKAI
TO MAIN PCB P406

EJECTOR BLOCK

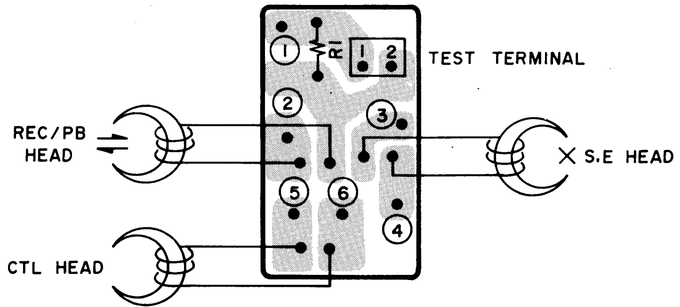

V1047
D5100
GCMK-35EHB
BRN
RED
PH1
R1
TO MAIN PCB P404
ORN
RED
BRN
RED
BRN

SENSOR LED PCB
V1047D5100

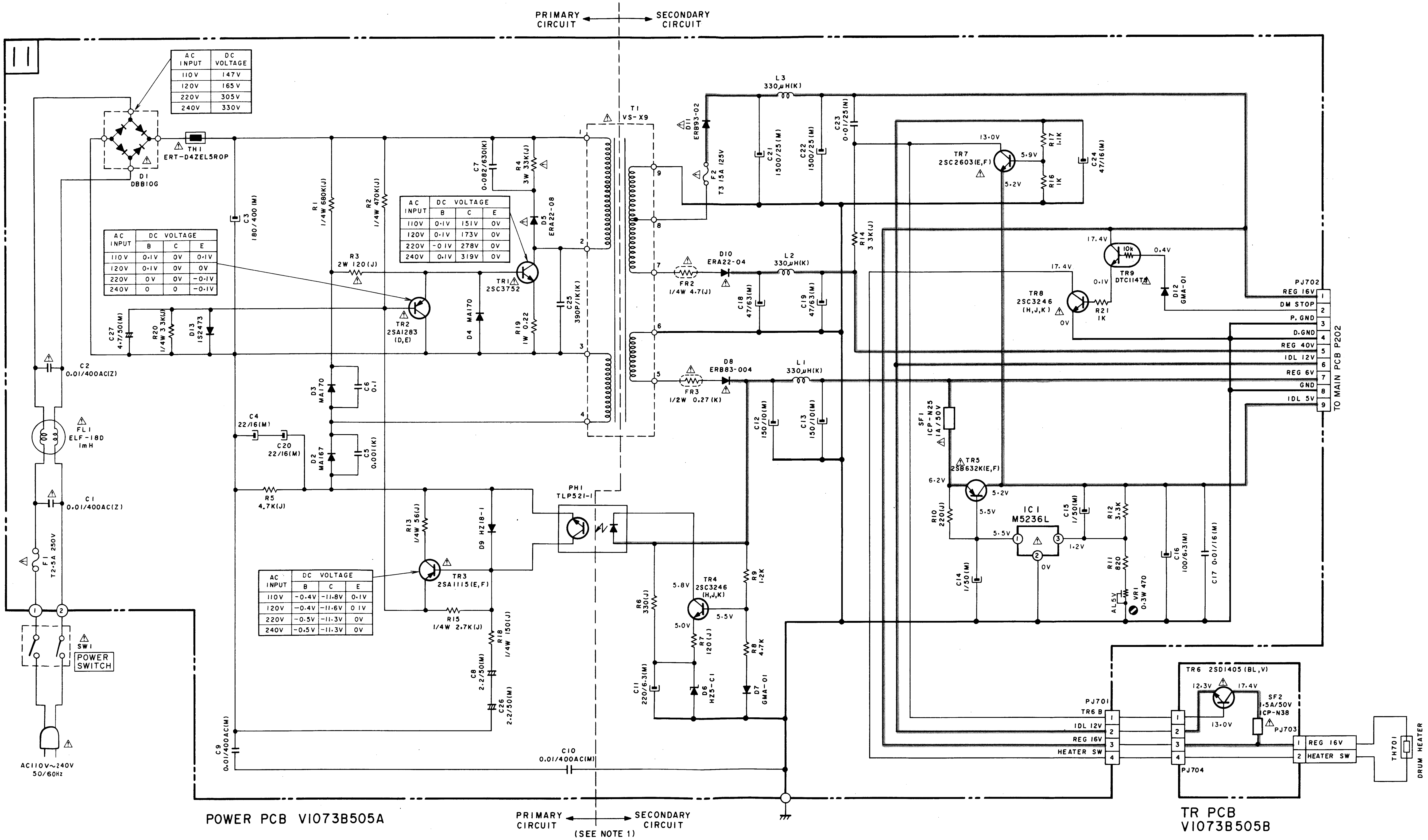
SENSOR REEL PCB
V1071D5500



F.E HEAD PCB
V1047D5160


TEST TERMINAL
REC/PB HEAD
CTL HEAD
S.E HEAD
R1

A/C HEAD PCB
V1047D5150


PRIMARY CIRCUIT
SECONDARY CIRCUIT
11
D1 DBB10G
TH1 ERT-D4ZEL5ROP
C3 180/400(M)
R1 1/4W 680K(J)
R2 1/4W 470K(J)
C7 0.082/630(K)
R4 3W 33K(J)
D5 ERA22-08
R3 2W 120(J)
TR1 2SC3752
TR2 2SA1283 (D,E)
D4 MA170
R19 1W 0.22
C25 390P/1K(K)
C27 4.7/50(M)
R20 1/4W 3.3K(J)
D13 1S2473
C2 0.01/400AC(Z)
FL1 ELF-18D 1mH
C1 0.01/400AC(Z)
F1 T2.5A 250V
SW1 POWER SWITCH
AC110V~240V 50/60Hz
D3 MA170
C6 0.1
C4 22/16(M)
C20 22/16(M)
D2 MA167
C5 0.001(K)
R5 4.7K(J)
R13 1/4W 56(J)
D9 HZ18-1
TR3 2SA1115(E,F)
R15 1/4W 2.7K(J)
R18 1/4W 150(J)
C8 2.2/50(M)
C26 2.2/50(M)
C9 0.01/400AC(M)
C10 0.01/400AC(M)
PH1 TLP521-1
T1 VS-X9
D11 ERB93-02
F2 T3.15A 125V
L3 330μH(K)
C21 1500/25(M)
C22 1500/25(M)
C23 0.01/25(N)
D10 ERA22-04
FR2 1/4W 4.7(J)
L2 330μH(K)
C18 47/63(M)
C19 47/63(M)
D8 ERB83-004
FR3 1/2W 0.27(K)
L1 330μH(K)
C12 150/10(M)
C13 150/10(M)
R14 3.3K(J)
TR7 2SC2603(E,F)
13.0V
5.9V
5.2V
R17 1.1K
R16 1K
C24 47/16(M)
TR9 DTC114TA
10k
17.4V
0.4V
0.1V
D12 GMA-01
TR8 2SC3246 (H,J,K)
R21 1K
0V
SF1 ICP-N25 1A/50V
TR5 2SB632K(E,F)
6.2V
5.2V
5.5V
R10 220(J)
IC1 M5236L
1.2V
C15 1/50(M)
R12 3.3K
R11 820
VR1 0.3W 470
AL5V
C16 100/6.3(M)
C17 0.01/16(M)
C14 1/50(M)
R6 330(J)
TR4 2SC3246 (H,J,K)
5.8V
5.0V
R7 120(J)
R9 1.2K
R8 4.7K
C11 220/6.3(M)
D6 HZ5-C1
D7 GMA-01
PJ702
REG 16V
DM STOP
P. GND
D.GND
REG 40V
IDL 12V
REG 6V
GND
IDL 5V
TO MAIN PCB P202
PJ701
TR6 B
IDL 12V
REG 16V
HEATER SW
TR6 2SD1405(BL,V)
12.3V
17.4V
13.0V
SF2 1.5A/50V ICP-N38
PJ703
PJ704
REG 16V
HEATER SW
TH701
DRUM HEATER
POWER PCB V1073B505A
(SEE NOTE 1)
TR PCB V1073B505B

AC INPUT	DC VOLTAGE
110V	147V
120V	165V
220V	305V
240V	330V

AC INPUT	DC VOLTAGE		
	B	C	E
110V	0.1V	0V	0.1V
120V	0.1V	0V	0V
220V	0V	0V	-0.1V
240V	0	0	-0.1V

AC INPUT	DC VOLTAGE		
	B	C	E
110V	0.1V	151V	0V
120V	0.1V	173V	0V
220V	-0 1V	278V	0V
240V	0.1V	319V	0V

AC INPUT	DC VOLTAGE		
	B	C	E
110V	-0.4V	-11.8V	0.1V
120V	-0.4V	-11.6V	0 1V
220V	-0.5V	-11.3V	0V
240V	-0.5V	-11.3V	0V

* NOTE 1
THE PRIMARY AND SECONDARY CIRCUIT GROUNDS HAVE BEEN ISOLATED FROM EACH OTHER, SO THAT DUE CAUTION WILL BE REQUIRED ESPECIALLY WHEN TESTING THE PRIMARY CIRCUIT.
WHEN TESTING THE POWER SUPPLY CIRCUIT, BE SURE TO CONNECT A DUMMY RESISTOR ON AT THE REG 6V OUT TERMINAL, AND UNDER NO CIRCUMSTANCES SHOULD IT BE TESTED AT NO LOAD. (DUMMY RESISTOR: 20Ω, 2W)
THE CIRCUIT GENERATED FREQUENCY RANGES:
FROM 20KHZ (FOR A HEAVY LOAD OR AT A LOW AC VOLTAGE)
TO 200KHZ (FOR A LIGHT LOAD OR AT A HIGH AC VOLTAGE)

WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

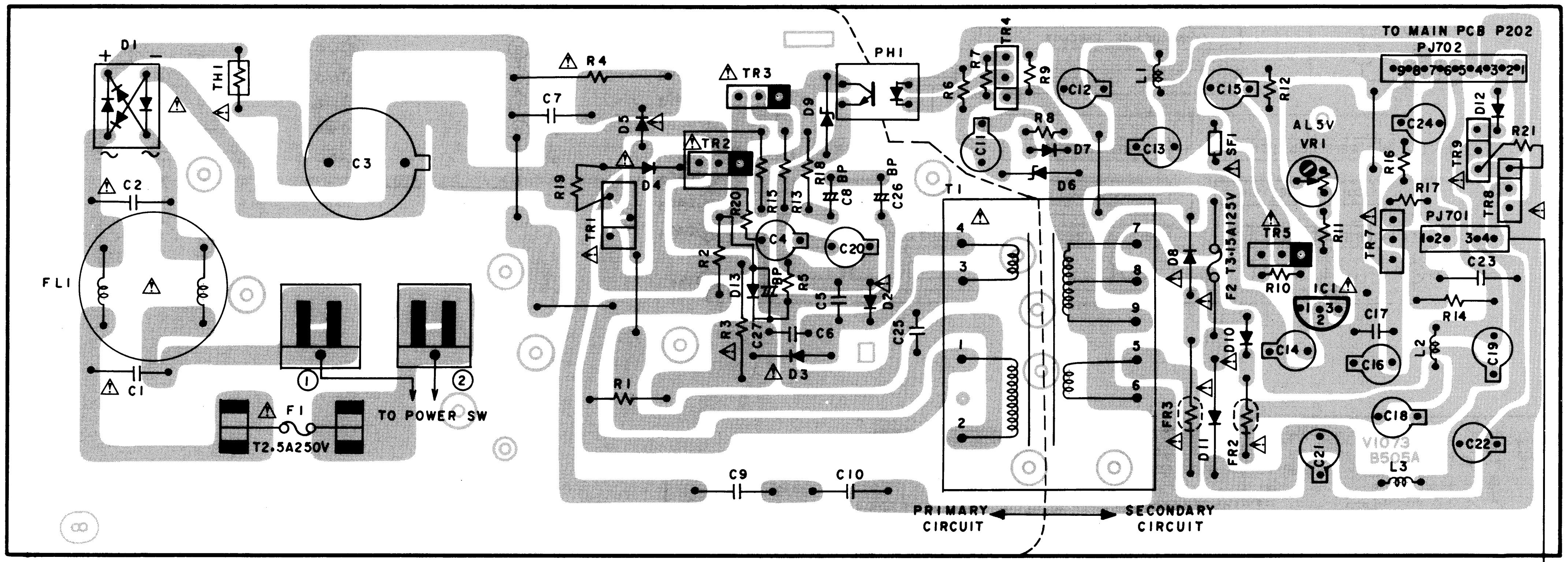
NOTE 2
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W (F)
ALL CAPACITORS IN μF 50WV (J)

* MEASURED WITH THE DIGITAL VOLTMETER IN DC RANGE.

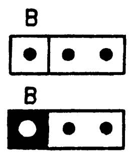
▬ B(POWER SUPPLY)LINE

VS-X9EGN POWER SCHEMATIC DIAGRAM

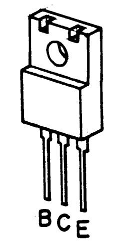
NO.7-2 870406A(A2) 2


TO MAIN PCB P202
PJ702
9 8 7 6 5 4 3 2 1
D1
TH1
C3
C2
C1
FL1
F1
T2.5A250V
TO POWER SW
① ②
R4
C7
D5
D4
R19
TR1
TR3
TR2
R20
R15
R13
R18
C8 BP
C26 BP
D9
C4
C20
R2
D13
R3
C27
BP
R5
C5
D2
C6
D3
C25
R1
C9
C10
PH1
R6
R7
TR4
R9
R8
D7
D6
C11
C12
C13
L1
T1
4 3 1 2 7 8 9 5 6
PRIMARY CIRCUIT
SECONDARY CIRCUIT
D8
F2 T3.15A125V
D10
FR3
D11
FR2
C14
C15
R12
SF1
AL5V
VR1
TR5
R10
IC1
1 3 2
R11
C17
C16
C21
C18
V1073 B505A
L3
C22
L2
C19
R14
C23
PJ701
1 2 3 4
TR7
R16
R17
C24
D12
TR9
R21
TR8

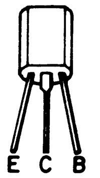
SW POWER PCB V1073B5050


B
= NPN TRANSISTOR
B
= PNP TRANSISTOR

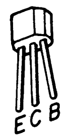
TR1---2SC3752
TR2---2SA1283
TR3---2SA1115
TR4,8--2SC3246
TR5---2SB632K
TR6---2SD1405
TR7---2SC2603
TR9---DTC114TS



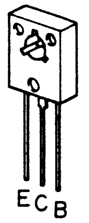
2SC3752



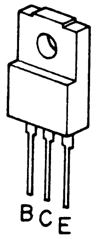
2SA1283
2SC3246



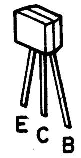
2SA1115
2SC2603



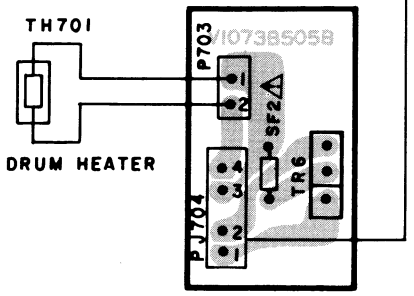
2SB632



2SD1405



DTC114TS

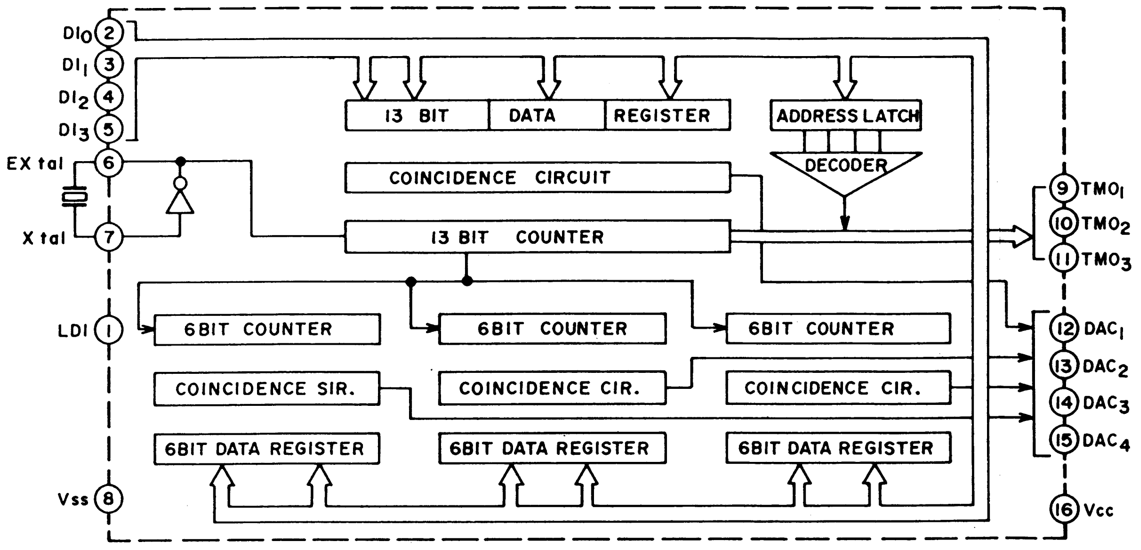

TH701
DRUM HEATER
P703
V1073B505B
1
2
SF2
TR6
PJ704
4
3
2
1

TR PCB
V1073B505B

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

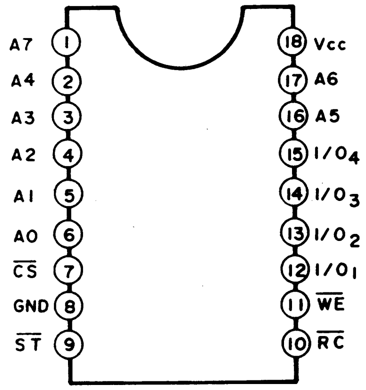
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

MB88301A-P(D/A CONVERTER)



DI0 2
DI1 3
DI2 4
DI3 5
EX tal 6
X tal 7
LDI 1
Vss 8
13 BIT
DATA
REGISTER
ADDRESS LATCH
DECODER
COINCIDENCE CIRCUIT
13 BIT COUNTER
6BIT COUNTER
6BIT COUNTER
6BIT COUNTER
COINCIDENCE SIR.
COINCIDENCE CIR.
COINCIDENCE CIR.
6BIT DATA REGISTER
6BIT DATA REGISTER
6BIT DATA REGISTER
9 TMO1
10 TMO2
11 TMO3
12 DAC1
13 DAC2
14 DAC3
15 DAC4
16 Vcc

MBM2212-25〔1K(1.024)-BIT NON VOLATILE SRAM〕

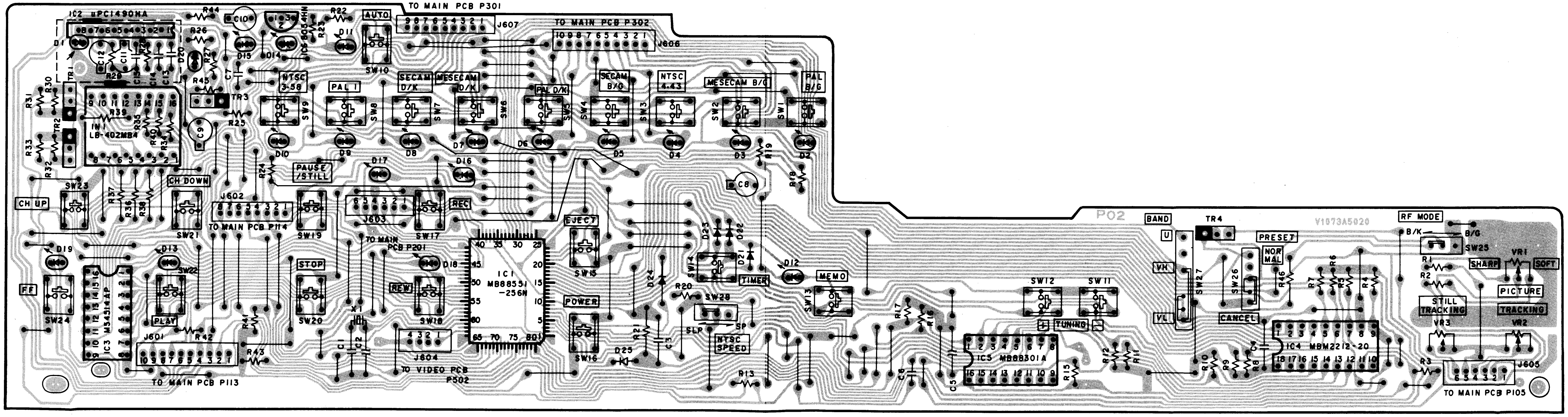


A7 1
A4 2
A3 3
A2 4
A1 5
A0 6
CS 7
GND 8
ST 9
18 Vcc
17 A6
16 A5
15 I/O4
14 I/O3
13 I/O2
12 I/O1
11 WE
10 RC

SYMBOL	PORT NAME
A0 to A7	Address inputs
I/O1 to I/O4	Data in/outputs
$\overline{\text{CS}}$	Chip select input
$\overline{\text{WE}}$	Write enable input
$\overline{\text{ST}}$	Store input
$\overline{\text{RC}}$	Recall input
Vcc	+B (+5V)
GND	Ground

$\overline{\text{CS}}$	$\overline{\text{WE}}$	$\overline{\text{RC}}$	$\overline{\text{ST}}$	MODE	DATE IN/OUT
H	*	H	H	NO FUNCTION	High impedance
L	H	H	H	SRAM READ MODE	IN
L	L	H	H	SRAM WRITE MODE	OUT
*	H	L	H	RECALL	High impedance
H	*	L	H	RECALL	// //
*	H	H	L⊔Γ	STORE	// //
H	*	H	L⊔Γ	STORE	// //

* : dont care

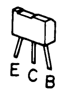


IC2 μPC1490HA
TO MAIN PCB P301
J607
TO MAIN PCB P302
J606
AUTO
NTSC 3.58
PAL I
SECAM D/K
MESECAM D/K
PAL D/K
SECAM B/G
NTSC 4.43
MESECAM B/G
PAL B/G
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
IN1 LB-402MB4
TR1
TR2
TR3
TR4
PAUSE /STILL
CH DOWN
CH UP
J602
TO MAIN PCB P114
J603
TO MAIN PCB P201
REC
EJECT
STOP
REW
PLAY
FF
POWER
TIMER
MEMO
SW11
SW12
SW13
SW14
SW15
SW16
SW17
SW18
SW19
SW20
SW21
SW22
SW23
SW24
SW25
SW26
SW27
SW28
SLP
SP
NTSC SPEED
IC1 MB88551 -256N
IC3 M54514P
IC4 MBM2212-20
IC5 MB88301A
J601
TO MAIN PCB P113
J604
TO VIDEO PCB P502
TUNING
BAND
PRESET
NOR MAL
CANCEL
VH
VL
U
RF MODE
B/K
B/G
SHARP
SOFT
PICTURE
STILL TRACKING
TRACKING
VR1
VR2
VR3
J605
TO MAIN PCB P105
P02
V1073A5020

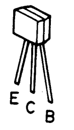
OPERATION PCB V1073A5020

TR1,2----2SB643
TR3-----DTA144ES
TR4-----2SA1115

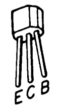
B ■●● = PNP TRANSISTOR



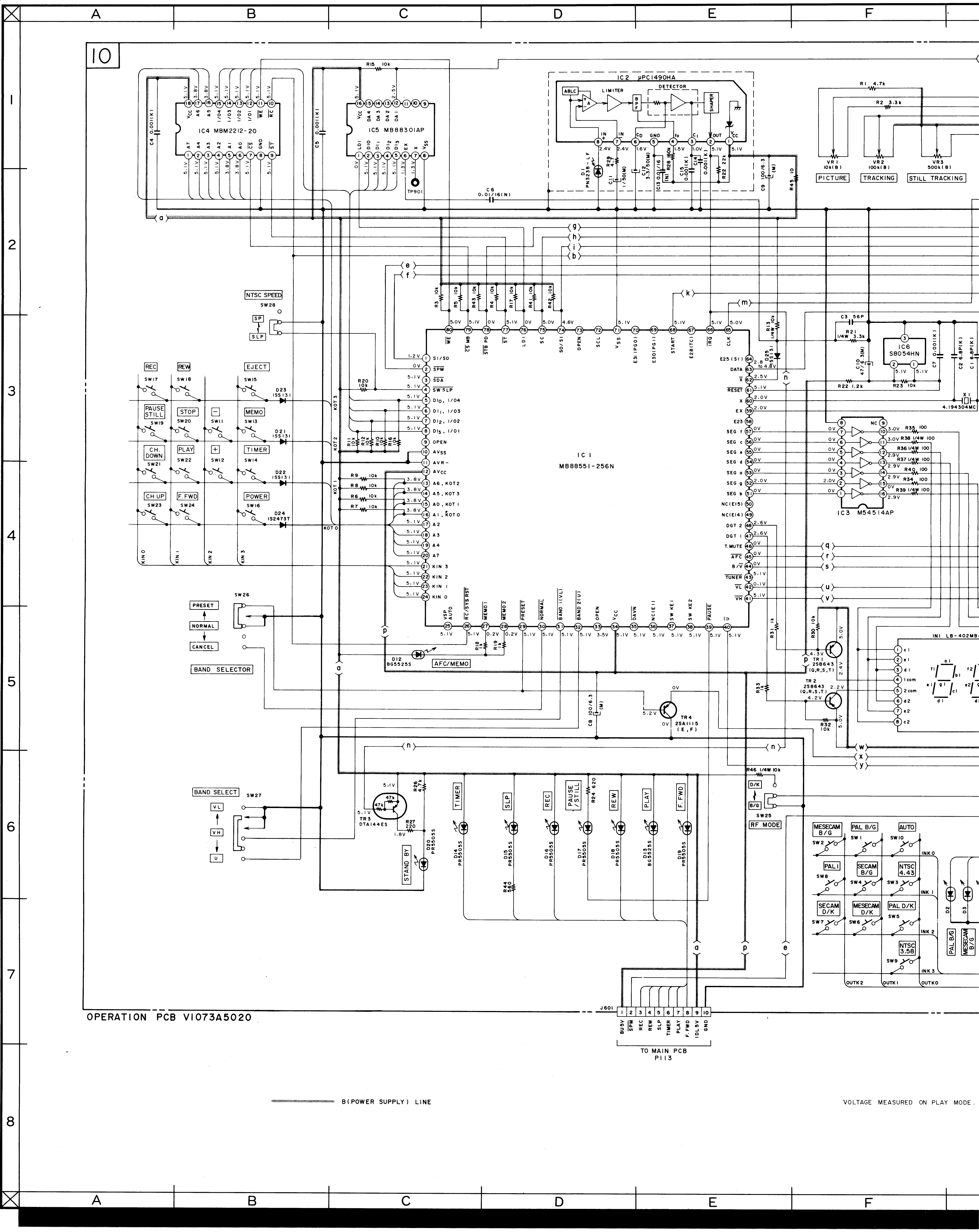
2SB643



DTA144ES



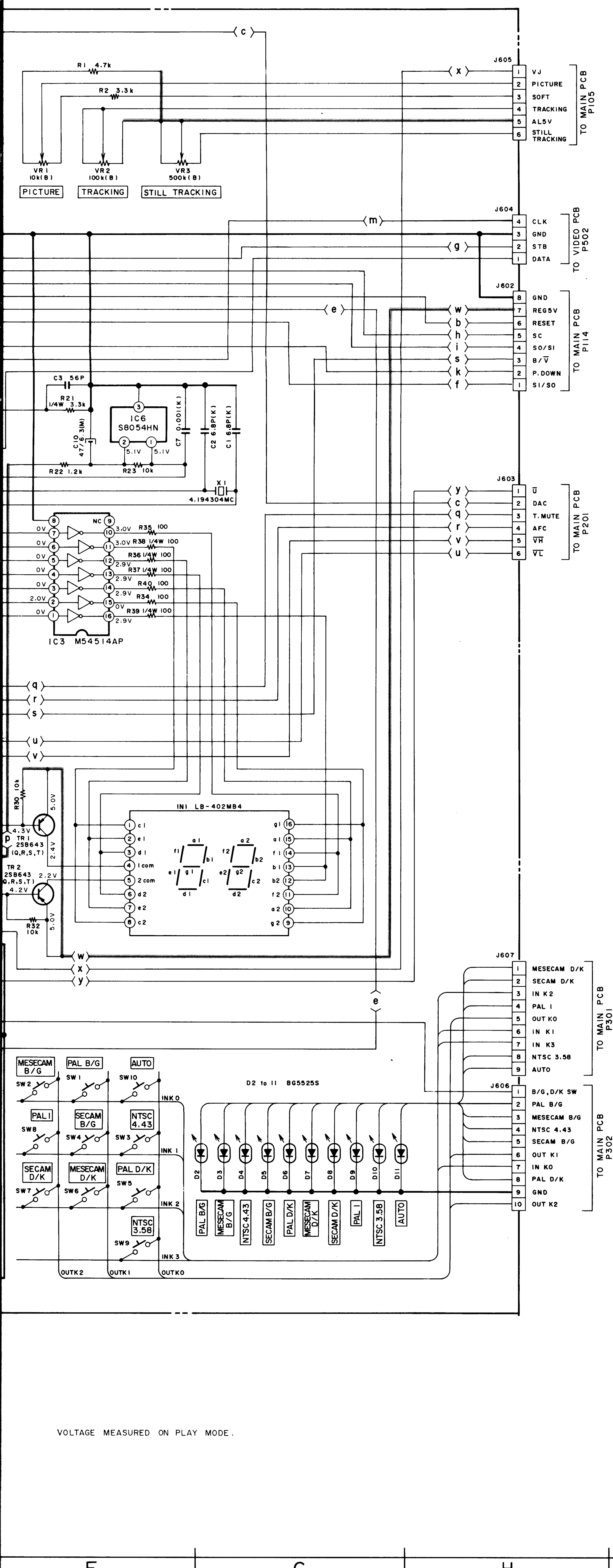
2SA1115


10
IC4 MBM2212-20
IC5 MB88301AP
IC2 μPC1490HA
ABLC
LIMITER
DETECTOR
SHAPER
TP901
C6 0.01/16(N)
R15 10k
VR1 10k(B)
VR2 100k(B)
VR3 500k(B)
PICTURE
TRACKING
STILL TRACKING
IC1 MB88551-256N
IC6 S8054HN
IC3 M54514AP
X1 4.194304MC
IN1 LB-402MB
NTSC SPEED
SW28
SP
SLP
REC
REW
EJECT
SW17
SW18
SW15
PAUSE STILL
STOP
−
MEMO
SW19
SW20
SW11
SW13
CH. DOWN
PLAY
+
TIMER
SW21
SW22
SW12
SW14
CH UP
F.FWD
POWER
SW23
SW24
SW16
D23 1SS131
D21 1SS131
D22 1SS131
D24 1S2473T
KOT 0
KOT 1
KOT 2
KOT 3
KIN 0
KIN 1
KIN 2
KIN 3
SW26
PRESET
NORMAL
CANCEL
BAND SELECTOR
BAND SELECT
SW27
VL
VH
U
D12 BG5525S
AFC/MEMO
TR1 2SB643 (Q,R,S,T)
TR2 2SB643 (Q,R,S,T)
TR3 DTA144ES
TR4 2SA1115 (E,F)
STAND BY
D20 PR5505S
D14 PR5505S
D15 PR5505S
D16 PR5505S
D17 PR5505S
D18 PR5505S
D13 BG5525S
D19 PR5505S
TIMER
SLP
REC
PAUSE /STILL
REW
PLAY
F.FWD
SW25
D/K
B/G
RF MODE
MESECAM B/G
PAL B/G
AUTO
PAL I
SECAM B/G
NTSC 4.43
SECAM D/K
MESECAM D/K
PAL D/K
NTSC 3.58
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
INK 0
INK 1
INK 2
INK 3
OUTK 0
OUTK 1
OUTK 2
J601
1 BU5V
2 SPM
3 REC
4 REW
5 SLP
6 TIMER
7 PLAY
8 F.FWD
9 IDL5V
10 GND
TO MAIN PCB P113

OPERATION PCB V1073A5020

B(POWER SUPPLY) LINE

VOLTAGE MEASURED ON PLAY MODE.


J605
1 VJ
2 PICTURE
3 SOFT
4 TRACKING
5 AL5V
6 STILL TRACKING
TO MAIN PCB P105
R1 4.7k
R2 3.3k
VR1 10k(B)
VR2 100k(B)
VR3 500k(B)
PICTURE
TRACKING
STILL TRACKING
J604
4 CLK
3 GND
2 STB
1 DATA
TO VIDEO PCB P502
J602
8 GND
7 REG5V
6 RESET
5 SC
4 SO/SI
3 B/V
2 P.DOWN
1 SI/SO
TO MAIN PCB P114
C3 56P
R21 1/4W 3.3k
IC6 S8054HN
C10 47/6.3(M)
C7 0.001(K)
C2 6.8P(K)
C1 6.8P(K)
5.1V
R22 1.2k
R23 10k
X1 4.194304MC
J603
1 U
2 DAC
3 T.MUTE
4 AFC
5 VH
6 VL
TO MAIN PCB P201
R35 100
R38 1/4W 100
R36 1/4W 100
R37 1/4W 100
R40 100
R34 100
R39 1/4W 100
IC3 M54514AP
IN1 LB-402MB4
R30 10k
TR1 2SB643 (Q,R,S,T)
TR2 2SB643 (Q,R,S,T)
R32 10k
J607
1 MESECAM D/K
2 SECAM D/K
3 IN K2
4 PAL I
5 OUT K0
6 IN K1
7 IN K3
8 NTSC 3.58
9 AUTO
TO MAIN PCB P301
J606
1 B/G,D/K SW
2 PAL B/G
3 MESECAM B/G
4 NTSC 4.43
5 SECAM B/G
6 OUT K1
7 IN K0
8 PAL D/K
9 GND
10 OUT K2
TO MAIN PCB P302
D2 to 11 BG5525S
MESECAM B/G SW2
PAL B/G SW1
AUTO SW10
PAL I SW8
SECAM B/G SW4
NTSC 4.43 SW3
SECAM D/K SW7
MESECAM D/K SW6
PAL D/K SW5
NTSC 3.58 SW9
INK0
INK1
INK2
INK3
OUTK2
OUTK1
OUTK0
PAL B/G
MESECAM B/G
NTSC4.43
SECAM B/G
PAL D/K
MESECAM D/K
SECAM D/K
PAL I
NTSC 3.58
AUTO

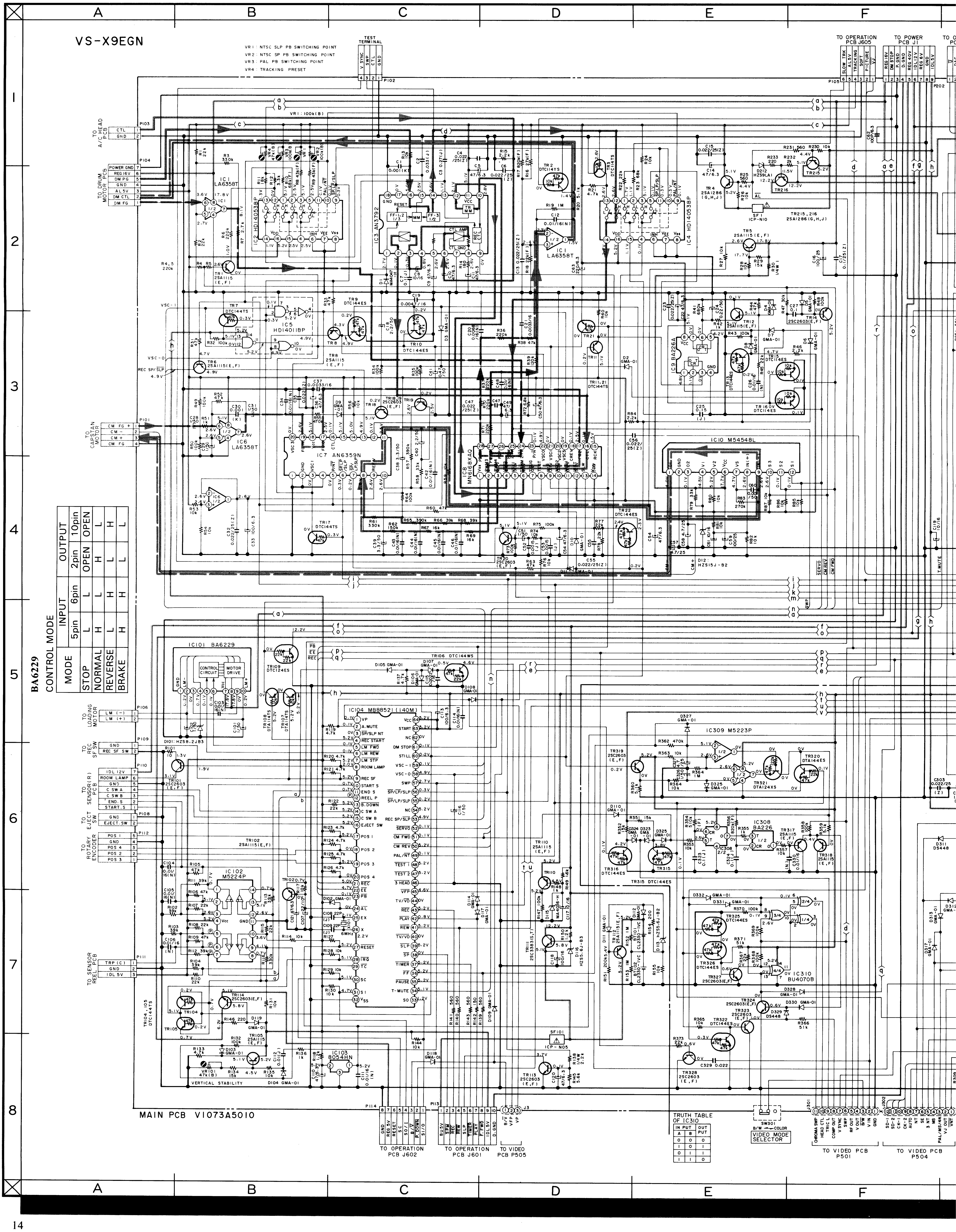
VOLTAGE MEASURED ON PLAY MODE.

MB88551-256N [OPERATION CPU (C·MOS 8K)]

Pin No.	Symbol	Remarks
1.	S1/0	Serial data input from Syscon CPU
2.	$\overline{\text{SPM}}$	Speed mode input L:SP, H:SP/SLP
3.	$\overline{\text{SDA}}$	NC
4.	$\overline{\text{SW SLP}}$	Speed selector input L:SLP, H:SP
5.	DI0,I/04	Data IN/OUT, Connect D/A converter, NVRAM
6.	DI1,I/03	
7.	DI2,I/02	
8.	DI3,I/01	
9.	OPEN	NC
10.	AV$_{SS}$	A/D converter ground
11.	AVR-	A/D converter minus ref. voltage
12.	AV$_{CC}$	A/D converter V$_{CC}$
13.	A6,KOT2	NVRAM address output/ key scan pulse output
14.	A5,KOT3	
15.	A0,KOT0	
16.	A1 KOT1	
17.	A2	NVRAM address output
18.	A3	
19.	A4	
20.	A7	
21.	KIN3	Key scan input
22.	KIN2	
23.	KIN1	
24.	KIN0	
25.	VPS AUTO	NC
26.	$\overline{\text{RC}}$	NVRAM Recall L:Recall, H:don't care
27.	MEMO 1	MEMO LED control L:Lit
28.	MEMO 2	
29.	$\overline{\text{PRESET}}$	PRESET, BAND SELECT SLIDE switch input (low active)
30.	$\overline{\text{NORMAL}}$	
31.	$\overline{\text{BAND 1}}$	
32.	$\overline{\text{BAND 2}}$	
33.	OPEN	NC
34.	V$_{CC}$	+B
35.	DAVN	NC
36.	NC (EI)	NC
37.	SW KE1	Scan pulse output
38.	SW KE2	
39.	$\overline{\text{PAUSE}}$	PAUSE LED control
40.	$\overline{\text{U}}$	Tuner band out L:ON, H:OFF
41.	$\overline{\text{VH}}$	
42.	$\overline{\text{VL}}$	
43.	$\overline{\text{TUNER}}$	Tuner ON/OFF control L:ON, H:OFF
44.	B/$\overline{\text{V}}$	Black picture control L:VIDEO, H:Black picture
45.	AFC	Tuner AFC control L:ON, H:OFF
46.	T.MUTE	Tuner mute control L:OFF,H:ON
47.	DGT 1	7 Segment LED control
48.	DGT 2	
49.	NC	
50.	NC	
51.	SEG b	
52.	SEG g	
53.	SEG a	
54.	SEG d	
55.	SEG e	
56.	SEG c	
57.	SEG f	
58.	E23	NC
59.	EX	EXT X'tal terminal
60.	X	
61.	$\overline{\text{RESET}}$	System reset input
62.	$\overline{\text{X}}$	Inverted oscillater output
63.	DATA	Control data output for IMS IC
64.	E25	NC
65.	CLK	Serial clock output
66.	$\overline{\text{IRQ}}$	Remote control input
67.	E28	NC
68.	START	Power down detector input L:Power down H:don't care
69.	E30	NC
70.	E31	NC
71.	V$_{SS}$	Ground
72.	SCL	NC
73.	OPEN	NC
74.	SO/I	Serial data output, connect syscon CPU
75.	SC	Clock signal output connect syscon CPU
76.	LDI	D/A converter control clock output
77.	$\overline{\text{ST}}$	NVRAM store control L:Store, H:don't care
78.	$\overline{\text{STB PD}}$	IMS IC data store output
79.	$\overline{\text{CS MB}}$	NVRAM chip select L:Select, H:don't care
80.	$\overline{\text{WE}}$	NVRAM write enable L:Write, H:Read

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50 WV(J)

VS-X9EGN
OPERATION
SCHEMATIC DIAGRAM
NO.7-3 870409A


VS-X9EGN
VR1 : NTSC SLP PB SWITCHING POINT
VR2 : NTSC SP PB SWITCHING POINT
VR3 : PAL PB SWITCHING POINT
VR4 : TRACKING PRESET
TEST TERMINAL
V SYNC
SWP
CTL
GND
TO A/C HEAD PCB
TO DRUM MOTOR PCB
POWER GND
REG16V
DM PG
GND
AL5V
DM CTL
DM FG
TO CAPSTAN MOTOR
CM FG +
CM −
CM +
CM FG
TO LOADING MOTOR
LM (−)
LM (+)
TO REC SF SW
REC SF SW
TO SENSOR(R) PCB
IDL 12V
ROOM LAMP
C SW A
C SW B
END S
START S
TO EJECT SW
EJECT SW
TO ROTARY ENCODER
POS 1
POS 4
POS 2
POS 3
TO SENSOR REEL PCB
TRP (C)
IDL 5V
IC1 LA6358T
IC2 HD14053BP
IC3 AN3792
IC4 HD14053BP
IC5 HD14011BP
IC6 LA6358T
IC7 AN6359N
IC8 MN6168XAQ
IC9 BA226A
IC10 M54548L
IC101 BA6229
IC102 M5224P
IC103 8054HN
IC104 MB88521 (140M)
IC308 BA226
IC309 M5223P
IC310 BU4070B
SF1 ICP-N10
SF101 ICP-N05
VR101 47k (B) VERTICAL STABILITY
TO OPERATION PCB J605
SLOW TRK
AL5V
TRACKING
SOFT
PICTURE
VJ
TO POWER PCB J1
TO OPERATION PCB J602
TO OPERATION PCB J601
TO VIDEO PCB P505
TO VIDEO PCB P501
TO VIDEO PCB P504
SW301
B/W ⟷ COLOR
VIDEO MODE SELECTOR
MAIN PCB V1073A5010
A
B
C
D
E
F
1
2
3
4
5
6
7
8

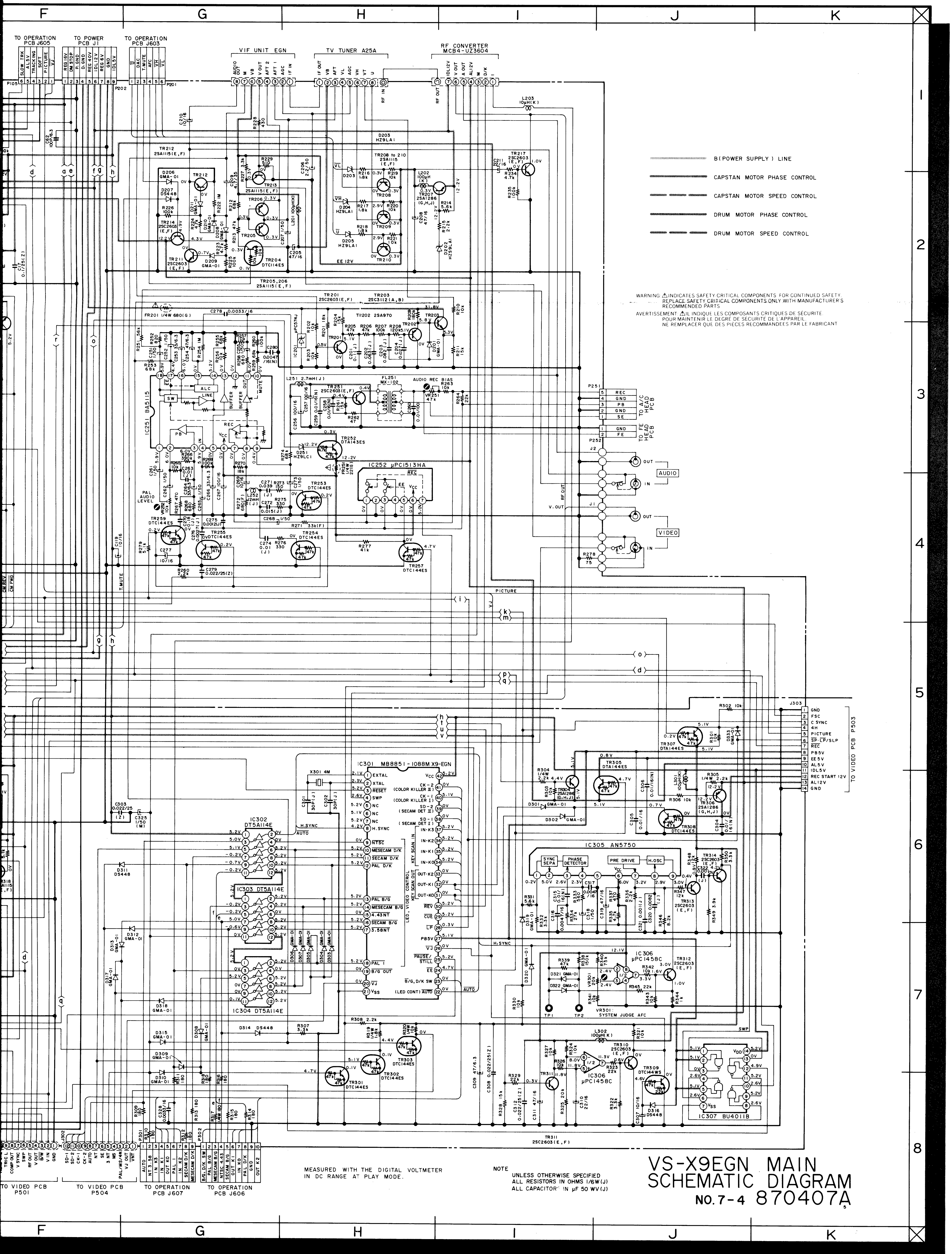
BA6229

CONTROL MODE

MODE	INPUT		OUTPUT	
	5pin	6pin	2pin	10pin
STOP	L	L	OPEN	OPEN
NORMAL	H	L	H	L
REVERSE	L	H	L	H
BRAKE	H	H	L	L

TRUTH TABLE OF IC310

IN PUT		OUT PUT
A	B	
0	0	0
1	0	1
0	1	1
1	1	0


F
G
H
I
J
K
1
2
3
4
5
6
7
8
TO OPERATION PCB J605
TO POWER PCB J1
TO OPERATION PCB J603
VIF UNIT EGN
TV TUNER A25A
RF CONVERTER MCB4-UZ3604
B (POWER SUPPLY) LINE
CAPSTAN MOTOR PHASE CONTROL
CAPSTAN MOTOR SPEED CONTROL
DRUM MOTOR PHASE CONTROL
DRUM MOTOR SPEED CONTROL
IC251 BA5115
IC252 μPC1513HA
IC301 MB8851-1088MX9-EGN
IC302 DT5A114E
IC303 DT5A114E
IC304 DT5A114E
IC305 AN5750
IC306 μPC1458C
IC307 BU4011B
P251
P252
TO A/C HEAD PCB
TO FE HEAD PCB
AUDIO
VIDEO
J303
TO VIDEO PCB P503
VR301: SYSTEM JUDGE AFC
TO VIDEO PCB P501
TO VIDEO PCB P504
TO OPERATION PCB J607
TO OPERATION PCB J606
PAL AUDIO LEVEL

WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.
REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S
RECOMMENDED PARTS

AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ.
POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL,
NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

MEASURED WITH THE DIGITAL VOLTMETER
IN DC RANGE AT PLAY MODE.

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50 WV(J)

VS-X9EGN MAIN SCHEMATIC DIAGRAM

NO.7-4 870407A

PRINCIPAL PARTS LOCATION

IC1 : E2
IC2 : E3
IC3 : E2
IC4 : E4
IC5 : C4
IC6 : C4
IC7 : D2
IC8 : D3
IC9 : D4
IC10 : C4

IC101 : C2
IC102 : C2
IC103 : A4
IC104 : B3

IC201 : F1

IC251 : G4
IC252 : F4

IC301 : B5
IC302 : B6
IC303 : B6
IC304 : B6
IC305 : D6
IC306 : D5
IC307 : E6
IC308 : G5
IC309 : G5
IC310 : F6

TR1 : E4
TR2 : E1
TR3 : E4
TR4 : E1
TR5 : C2
TR6 : C3
TR7 : C4
TR8 : B4
TR9 : B4
TR10 : B4
TR11 : D4
TR12 : D4
TR13 : D4
TR14 : D5
TR15 : E4
TR16 : E4
TR17 : C4
TR18 : D3
TR19 : D3
TR20 : D3
TR21 : C5
TR22 : C2

TR101 : B1
TR102 : B2
TR103 : A2
TR104 : A2
TR105 : A2
TR106 : B2
TR107 : A3
TR108 : A3
TR109 : A3
TR110 : A1
TR111 : A1
TR112 : B1
TR113 : B4

TR201 : F1
TR202 : F2
TR203 : F2
TR204 : F2
TR205 : F2
TR206 : F2
TR207 : F1
TR208 : F2
TR209 : F1
TR210 : F1
TR211 : G1
TR212 : G1
TR213 : G2
TR214 : F1
TR215 : F2
TR216 : F1
TR217 : G3

TR251 : F4
TR252 : F4
TR253 : F5
TR254 : F5
TR255 : F4
TR256 : F4
TR257 : F4

TR301 : C6
TR302 : C6
TR303 : C6
TR304 : E6
TR305 : E6
TR306 : F6
TR307 : C5
TR308 : D5
TR309 : C5
TR310 : D5
TR311 : C5
TR312 : D6
TR313 : D6
TR314 : D6
TR315 : F6
TR316 : F6
TR317 : G6
TR318 : G6
TR319 : F5
TR320 : G6
TR321 : G5
TR322 : G6
TR323 : G6
TR324 : F6
TR325 : G6
TR326 : G6
TR327 : G6
TR328 : G5

TP1 : D6
TP2 : D6

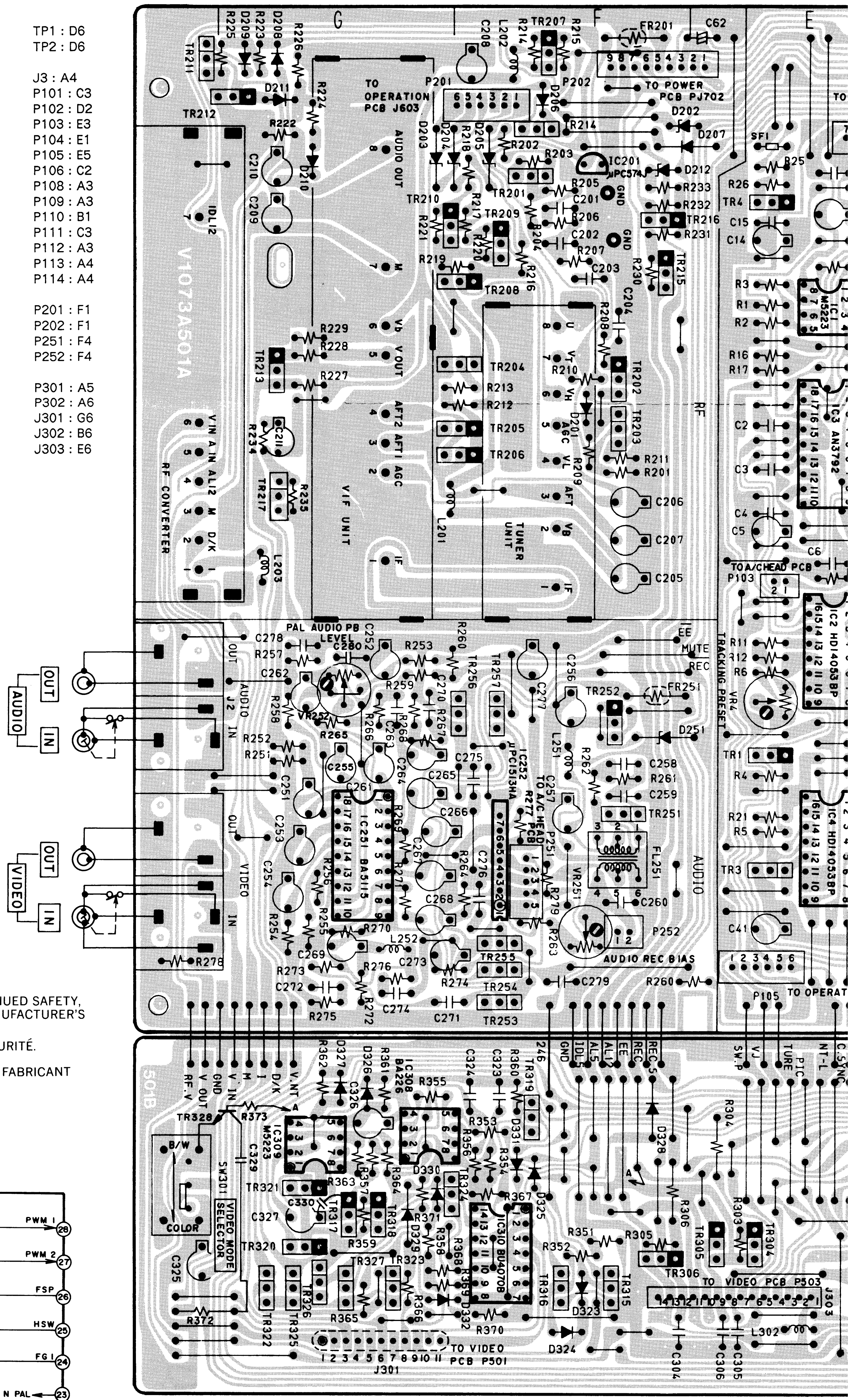
J3 : A4
P101 : C3
P102 : D2
P103 : E3
P104 : E1
P105 : E5
P106 : C2
P108 : A3
P109 : A3
P110 : B1
P111 : C3
P112 : A3
P113 : A4
P114 : A4

P201 : F1
P202 : F1
P251 : F4
P252 : F4

P301 : A5
P302 : A6
J301 : G6
J302 : B6
J303 : E6

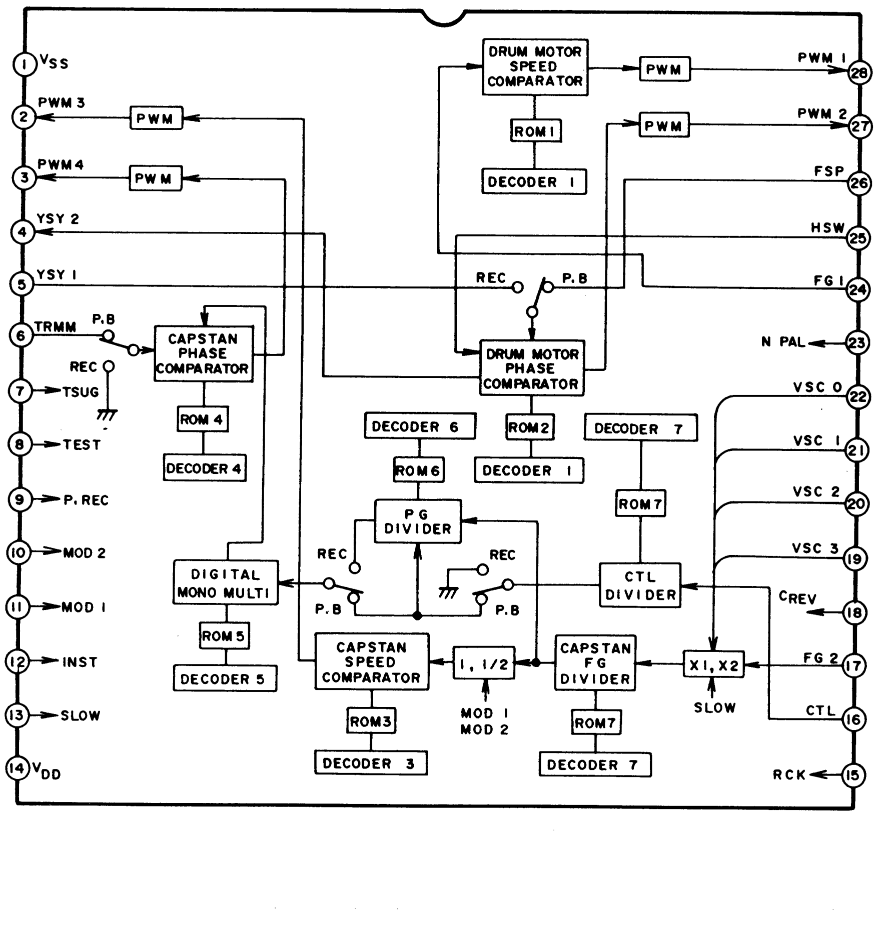
WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

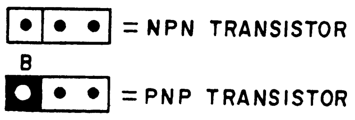
AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT


G
F
E
OUT
AUDIO
IN
OUT
VIDEO
IN
TO OPERATION PCB J603
TO POWER PCB PJ702
AUDIO OUT
V1073A501A
RF CONVERTER
VIF UNIT
TUNER UNIT
IC201 μPC574J
RF
TO A/CHEAD PCB P103
TRACKING PRESET
PAL AUDIO PB LEVEL
IC251 BA5115
IC252 μPC1513HA
TO A/C HEAD PCB
AUDIO REC BIAS
AUDIO
EE
MUTE
REC
IC2 HD14053BP
IC4 HD14053BP
IC3 AN3792
IC1 M5223
TO OPERAT
501B
B/W
COLOR
SW301 VIDEO MODE SELECTOR
IC309 M5223
IC308 BA226
IC310 BU4070B
TO VIDEO PCB P503
TO VIDEO PCB P501
J301
J303

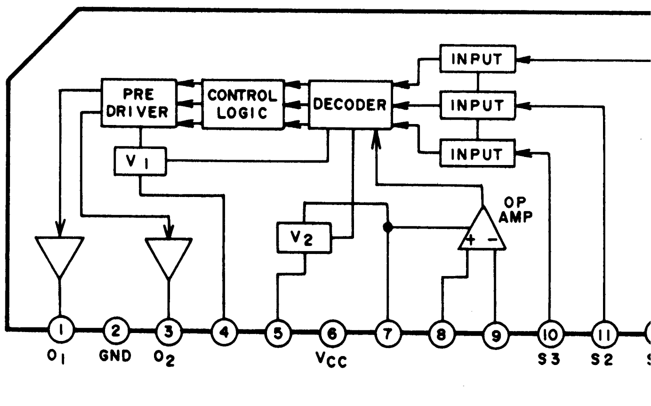
MAIN PCB V1073A501A/501B

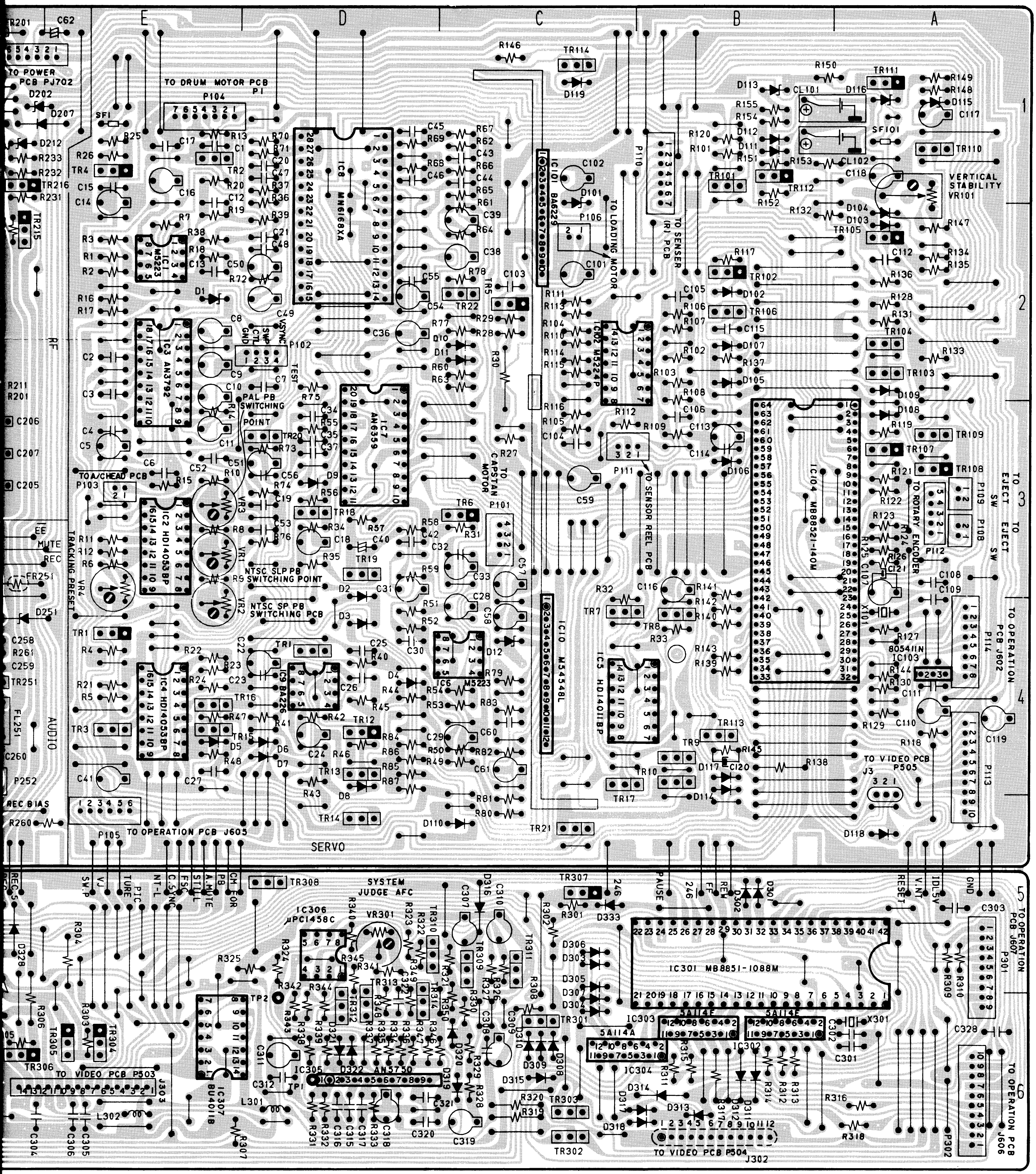
MN6168XAQ(SERVO MAIN)

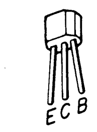

VSS
PWM 3
PWM 4
YSY 2
YSY 1
TRMM
TSUG
TEST
P. REC
MOD 2
MOD 1
INST
SLOW
VDD
PWM 1
PWM 2
FSP
HSW
FG 1
N PAL
VSC 0
VSC 1
VSC 2
VSC 3
CREV
FG 2
CTL
RCK
DRUM MOTOR SPEED COMPARATOR
PWM
ROM 1
DECODER 1
REC
P.B
DRUM MOTOR PHASE COMPARATOR
CAPSTAN PHASE COMPARATOR
ROM 4
DECODER 4
DECODER 6
ROM 2
DECODER 7
ROM 6
DECODER 1
PG DIVIDER
ROM 7
CTL DIVIDER
DIGITAL MONO MULTI
ROM 5
DECODER 5
CAPSTAN SPEED COMPARATOR
1, 1/2
MOD 1
MOD 2
CAPSTAN FG DIVIDER
X1, X2
SLOW
ROM3
DECODER 3
ROM7
DECODER 7


B
= NPN TRANSISTOR
B
= PNP TRANSISTOR

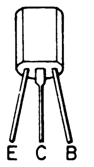
M54548L(CAPSTAN MOTOR DRIVER)


PRE DRIVER
CONTROL LOGIC
DECODER
INPUT
INPUT
INPUT
V1
V2
OP AMP
O1
GND
O2
VCC
S3
S2

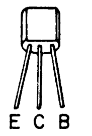

E
D
C
B
A
1
2
3
4
5
6
TO POWER PCB PJ702
TO DRUM MOTOR PCB P1
P104
IC8 MN6168XA
IC101 BA6229
TO LOADING MOTOR
TO SENSOR (R) PCB
P110
VERTICAL STABILITY VR101
IC1 M5223
IC3 AN3792
IC7 AN6359
IC2 HD14053BP
IC4 HD14053BP
IC9 BA226
IC6 M5223
IC10 M54548L
IC102 M5224P
IC104 MB8821-140M
IC5 HD14011BP
IC103 80541IN
PAL PB SWITCHING POINT
NTSC SLP PB SWITCHING POINT
NTSC SP PB SWITCHING PCB
TRACKING PRESET
TO A/C HEAD PCB P103
TO CAPSTAN MOTOR
TO SENSOR REEL PCB
TO ROTARY ENCODER
TO EJECT SW
TO EJECT SW
TO OPERATION PCB J602
TO VIDEO PCB P505
TO OPERATION PCB J605
RF
AUDIO
SERVO
REC BIAS
SYSTEM JUDGE AFC
IC306 μPC1458C
VR301
IC301 MB8851-1088M
IC303 5A114F
IC302 5A114F
IC304 5A114A
IC305 AN5750
IC307 BU4011B
TO VIDEO PCB P503
TO VIDEO PCB P304
TO OPERATION PCB J601
TO OPERATION PCB J606
P301
P302
J302
J303



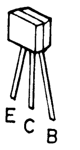
2SA1115
2SC2603



2SA1286



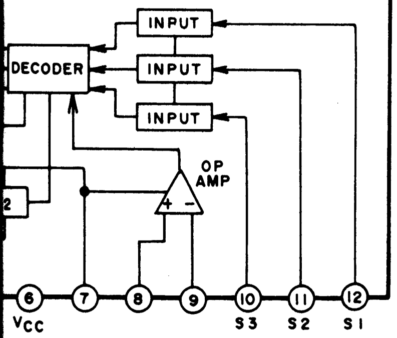
2SC3383
2SA970
2SC3112



DTC144TS
DTC144ES
DTC144WS
DTC114YS
DTC114TS
DTC114ES
DTA144ES
DTA114TS
DTC124ES
DTA143ES
DTA124XS

501A/501B

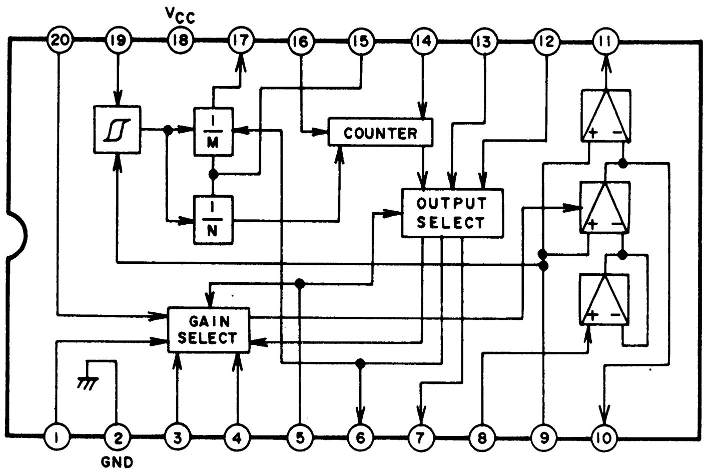
MOTOR DRIVER)


INPUT
INPUT
INPUT
DECODER
OP AMP
2
6
7
8
9
10
11
12
Vcc
S3
S2
S1

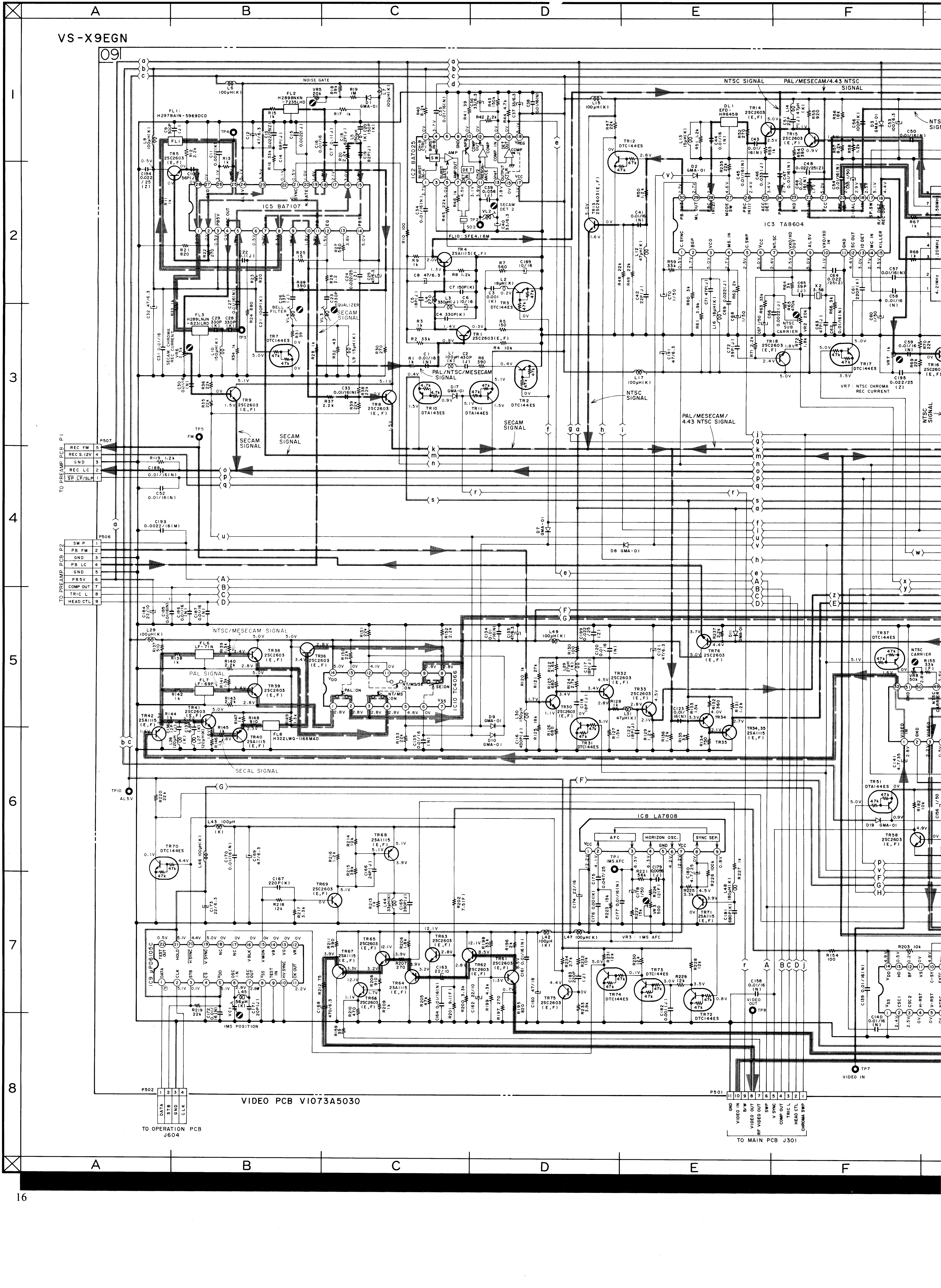
M54548L TRUTH TABLE

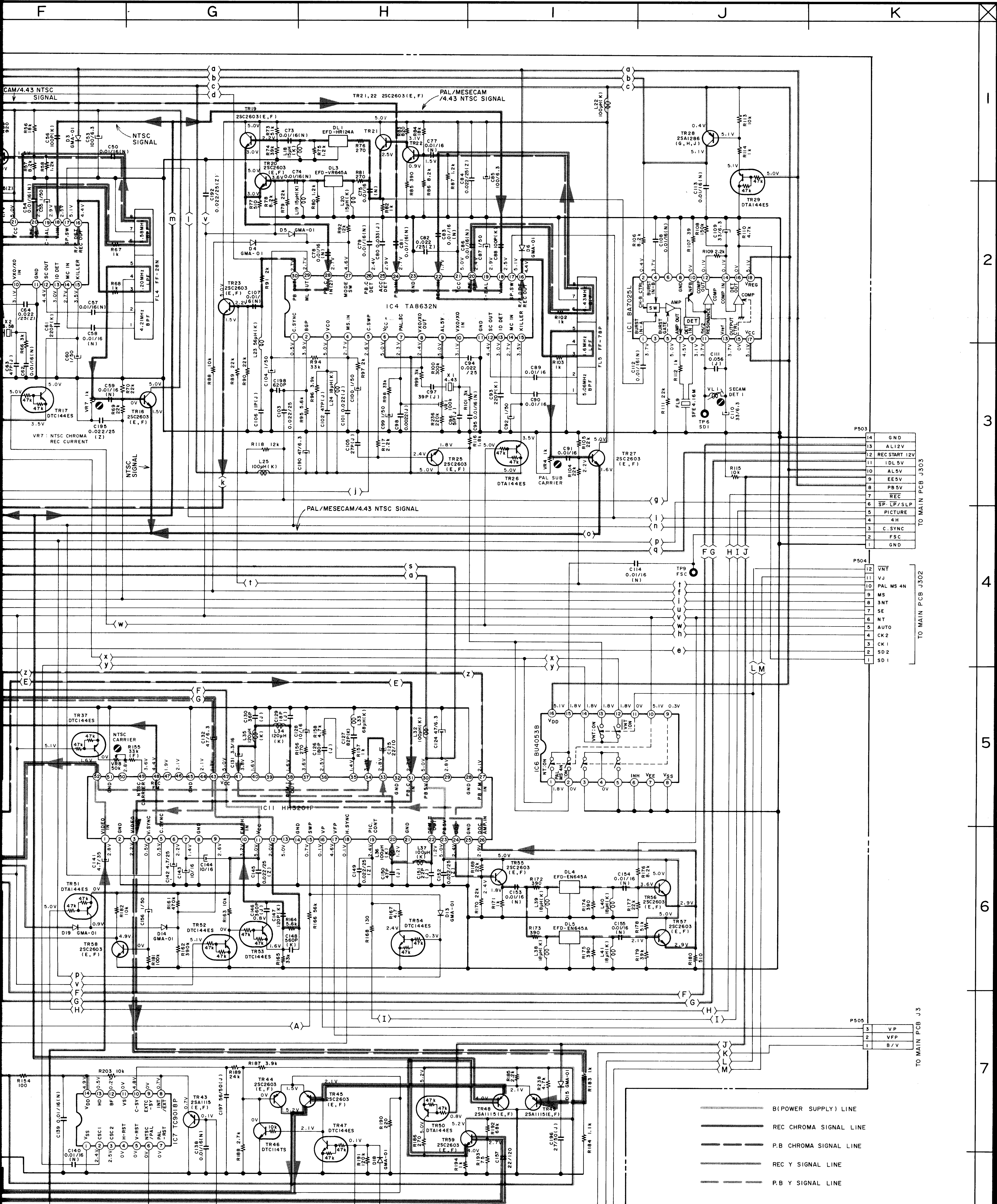
INPUT			OUTPUT		MODE
S1	S2	S3	01	02	
L	L	L	"OFF" STATE	"OFF" STATE	STOP
L	L	H	H	L	PLAY(+)
L	H	L	L	H	PLAY(−)
L	H	H	H	L	F.FWD(2)
H	L	L	L	H	REW(2)
H	L	H	H	L	F.FWD(1)
H	H	L	L	H	REW(1)
H	H	H	L	L	BRAKE

AN6359N(CAPSTAN INTERFACE)


Vcc
20
19
18
17
16
15
14
13
12
11
M
N
COUNTER
OUTPUT SELECT
GAIN SELECT
1
2
3
4
5
6
7
8
9
10
GND

VS-X9EGN


A
B
C
D
E
F
1
2
3
4
5
6
7
8
09
NOISE GATE
FL1 H297BAIN-5969DCD
FL2 H289BNKN-7235LHD
FL3 H289LNJN-6231LRD
IC5 BA7107
IC2 BA7025
IC3 TA8604
IC10 TC4066
IC8 LA7808
IC9 μPD6105C
NTSC SIGNAL
PAL/MESECAM/4.43 NTSC SIGNAL
PAL/NTSC/MESECAM SIGNAL
SECAM SIGNAL
SECAM DET 2
FL10 : SFE4.16M
BELL FILTER
EQUALIZER
SECAM CHROMA REC CURRENT
NTSC/MESECAM SIGNAL
PAL SIGNAL
SECAL SIGNAL
FL6 LF-71N
FL7 LF-69P
FL8 H322LWQ-1166MAD
DL1 EFD-HR645B
VR7 : NTSC CHROMA REC CURRENT
NTSC SUB CARRIER
NTSC CARRIER
VR3 : IMS AFC
IMS POSITION
AFC
HORIZON OSC.
SYNC SEP.
TO PREAMP PCB P1
P507
REC FM
REC S.12V
GND
REC LC
SP LP/SLP
TO PREAMP PCB P2
P506
SW P
PB FM
GND
PB LC
GND
PB5V
COMP OUT
TRIC L
HEAD CTL
TP1
TP2
TP3
TP4
TP5 FM
TP7 VIDEO IN
TP8 VIDEO OUT
TP10 AL5V
P502
DATA
STB
GND
CLK
TO OPERATION PCB J604
VIDEO PCB V1073A5030
P501
GND
VIDEO IN
B/W
VIDEO OUT
RF VIDEO OUT
CHROMA SWP
V SYNC
COMP OUT
TRIC L
HEAD CTL
TO MAIN PCB J301



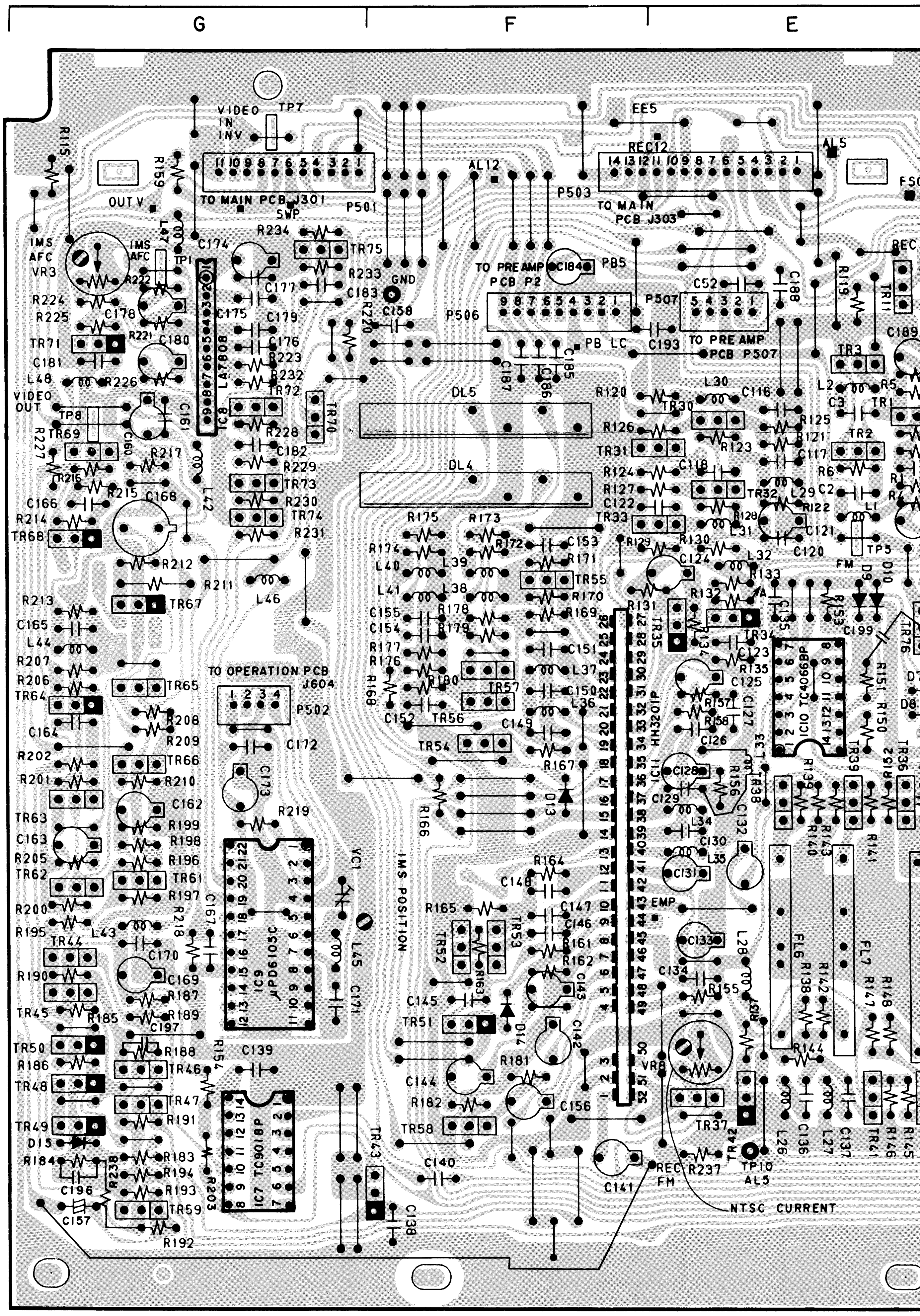
F
G
H
I
J
K
1
2
3
4
5
6
7
8
NTSC SIGNAL
PAL/MESECAM /4.43 NTSC SIGNAL
TR21,22 2SC2603(E,F)
TR19 2SC2603(E,F)
TR20 2SC2603 (E,F)
DL1 EFD-HR124A
DL3 EFD-VR645A
TR28 2SA1286 (G,H,J)
TR29 DTA144ES
IC4 TA8632N
IC1 BA7025L
FL4 FF-28N
FL5 FF-78P
FL9 SFE4.16M
TR23 2SC2603 (E,F)
TR16 2SC2603 (E,F)
TR17 DTC144ES
VR7 : NTSC CHROMA REC CURRENT
TR25 2SC2603 (E,F)
TR26 DTA144ES
TR27 2SC2603 (E,F)
VR4 PAL SUB CARRIER
SECAM DET 1
TP6 SDI
TP9 FSC
PAL/MESECAM/4.43 NTSC SIGNAL
P503
14 GND
13 AL12V
12 REC START 12V
11 IDL5V
10 AL5V
9 EE5V
8 PB5V
7 REC
6 SP.LP/SLP
5 PICTURE
4 4H
3 C.SYNC
2 FSC
1 GND
TO MAIN PCB J303
P504
12 VNT
11 VJ
10 PAL MS 4N
9 MS
8 3NT
7 SE
6 NT
5 AUTO
4 CK2
3 CK1
2 SD2
1 SD1
TO MAIN PCB J302
TR37 DTC144ES
NTSC CARRIER
IC11 HA11201P
IC6 BU4053B
TR55 2SC2603 (E,F)
DL4 EFD-EN645A
DL5 EFD-EN645A
TR56 2SC2603 (E,F)
TR57 2SC2603 (E,F)
TR51 DTA144ES
TR58 2SC2603 (E,F)
TR52 DTC144ES
TR53 DTC144ES
TR54 DTC144ES
P505
3 VP
2 VFP
1 B/V
TO MAIN PCB J3
IC7 TC9018P
TR43 2SA1115 (E,F)
TR44 2SC2603 (E,F)
TR45 2SC2603 (E,F)
TR46 DTC114TS
TR47 DTC144ES
TR48 2SA1115(E,F)
TR49 2SA1115(E,F)
TR50 DTA144ES
TR59 2SC2603 (E,F)
TP7 VIDEO IN
B(POWER SUPPLY) LINE
REC CHROMA SIGNAL LINE
P.B CHROMA SIGNAL LINE
REC Y SIGNAL LINE
P.B Y SIGNAL LINE

NOTE : UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN µF 50 WV(M)

VS-X9EGN VIDEO SCHEMATIC DIAGRAM

NO.7-5 870408A

MEASURED WITH THE DIGITAL VOLTMETER IN DC RANGE AT PLAY MODE.


G
F
E
VIDEO IN INV
TP7
TO MAIN PCB J301
SWP
P501
AL12
P503
REC12
TO MAIN PCB J303
EE5
AL5
IMS AFC VR3
IMS AFC
TP1
OUT V
LA7808
IC8
TO PREAMP PCB P2
PB5
P506
P507
TO PRE AMP PCB P507
PB LC
GND
DL5
DL4
VIDEO OUT
TP8
TO OPERATION PCB J604
P502
IC9 μPD6105C
IC7 TC9018P
IMS POSITION
VC1
IC11 HM3201P
IC10 TC4066BP
EMP
VR8
TP10
AL5
REC FM
NTSC CURRENT
FL6
FL7
TP5
FM

PRINCIPAL PARTS LOCATION

IC1 : D2
IC2 : C2
IC3 : B4
IC4 : C4
IC5 : B2
IC6 : B4
IC7 : G4
IC8 : G2
IC9 : G4
IC10 : E3
IC11 : F3

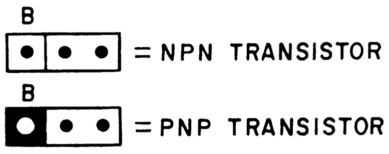
TP : G1
TP2 : C2
TP3 : B2
TP4 : A2
TP5 : E2
TP6 : D2
TP7 : G1
TP8 : G2
TP9 : D1
TP10 : E4

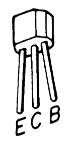
P501 : G1
P502 : G3
P503 : E1
P504 : B1
P505 : A1
P506 : F1
P507 : E1

TR1 : E2
TR2 : E2
TR3 : E2
TR4 : D2
TR5 : B2
TR7 : B2
TR8 : C3
TR9 : B1
TR10 : D1
TR11 : E1
TR12 : A3
TR13 : A3
TR14 : B3
TR15 : B3
TR16 : B3
TR17 : B4
TR18 : A4
TR19 : C3
TR20 : C3
TR21 : D3
TR22 : D3
TR23 : C3
TR25 : C4
TR26 : D4
TR27 : D4
TR28 : C1
TR29 : C1
TR30 : E2
TR31 : E2
TR32 : E2
TR33 : E2

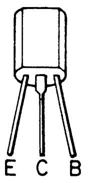
TR34 : E3
TR35 : [illegible]
TR36 : E3
TR37 : E4
TR38 : E3
TR39 : E3
TR40 : E4
TR41 : E4
TR42 : E4
TR43 : F4
TR44 : G4
TR45 : G4
TR46 : G4
TR47 : G4
TR48 : G4
TR49 : G4
TR50 : G4
TR51 : F4
TR52 : F4
TR53 : F4
TR54 : F3
TR55 : F2
TR56 : F3
TR57 : F3
TR58 : F4
TR59 : G4
TR61 : G3
TR62 : G3
TR63 : G3
TR64 : G3
TR65 : G3

TR66 : G3
TR67 : G2
TR68 : G2
TR69 : G2
TR70 : G2
TR71 : G2
TR72 : G2
TR73 : G2
TR74 : G2
TR75 : G1
TR76 : E3

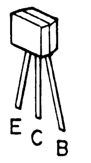

B
= NPN TRANSISTOR
B
= PNP TRANSISTOR



2SC2603
2SA1115

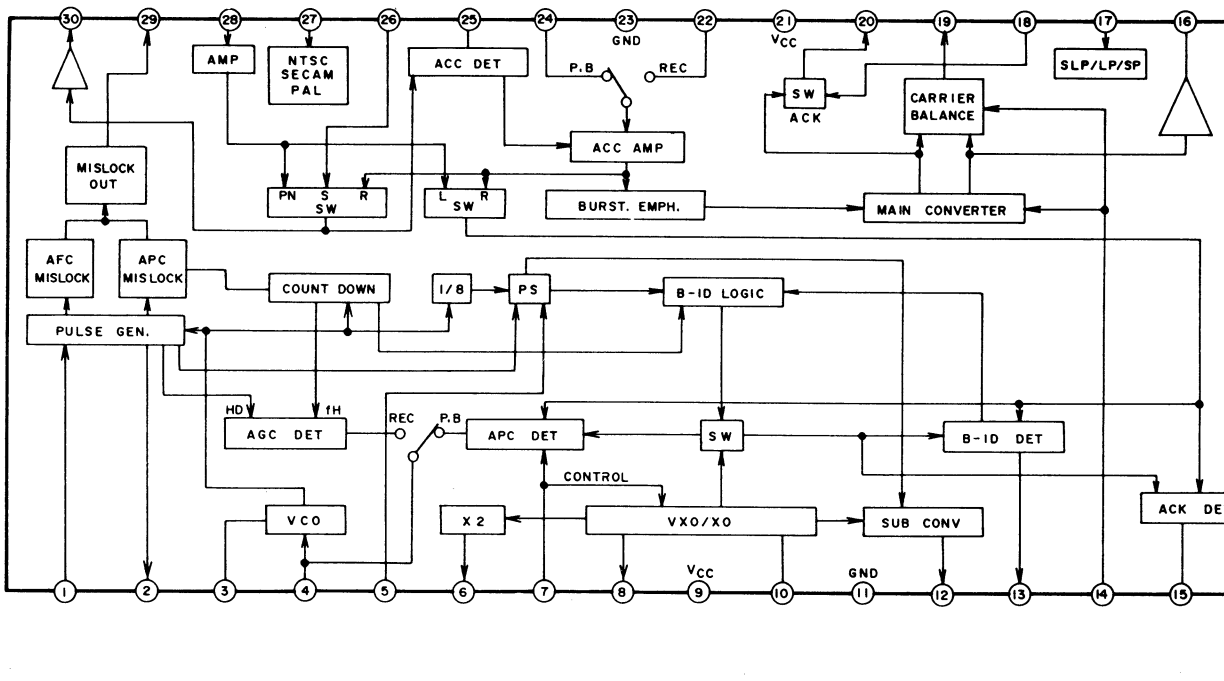


2SA1286

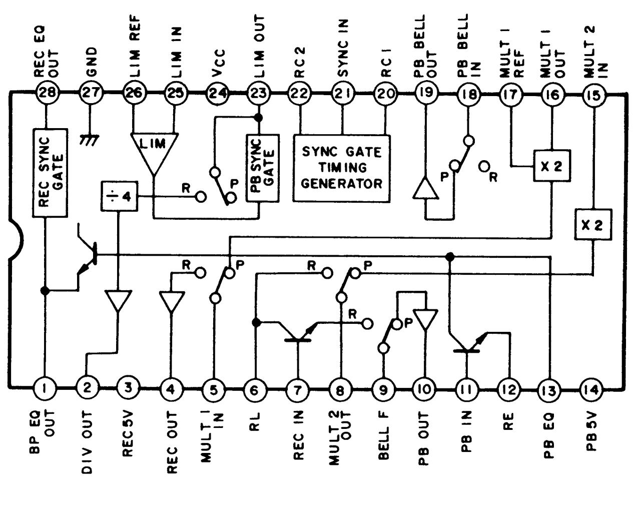


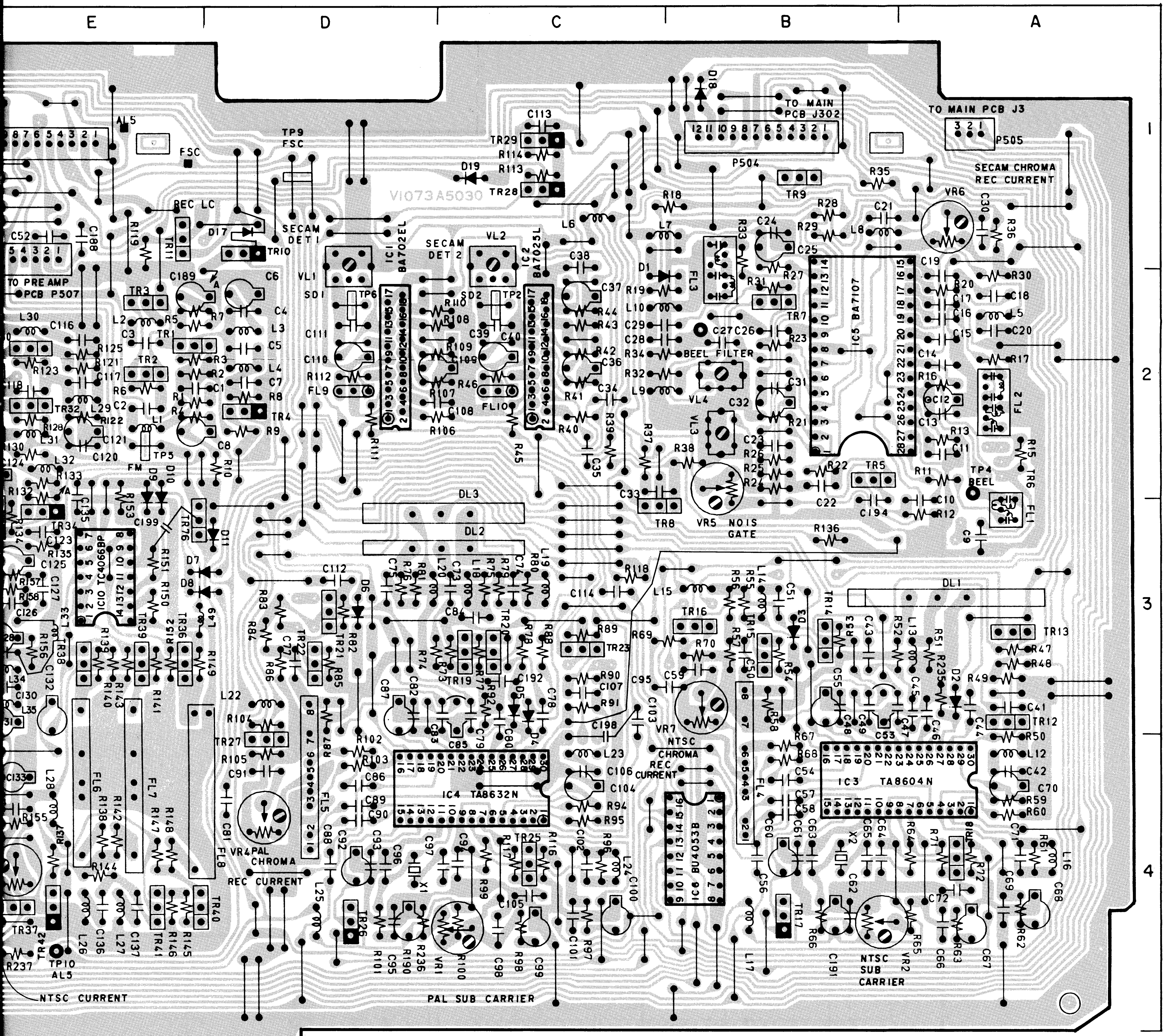
DTC144ES
DTA144ES
DTA143ES
DTC114TS

TA8604N, TA8632N(NTSC/PAL/MESECAM CHROMA SIGNAL PROCCESSING IC)


30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
AMP
NTSC SECAM PAL
ACC DET
GND
Vcc
P.B
REC
SW
ACK
CARRIER BALANCE
SLP/LP/SP
ACC AMP
MISLOCK OUT
PN S R SW
L R SW
BURST. EMPH.
MAIN CONVERTER
AFC MISLOCK
APC MISLOCK
COUNT DOWN
1/8
PS
B-ID LOGIC
PULSE GEN.
HD
fH
AGC DET
REC
P.B
APC DET
SW
B-ID DET
CONTROL
VCO
X 2
VXO/XO
SUB CONV
ACK DET
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Vcc
GND

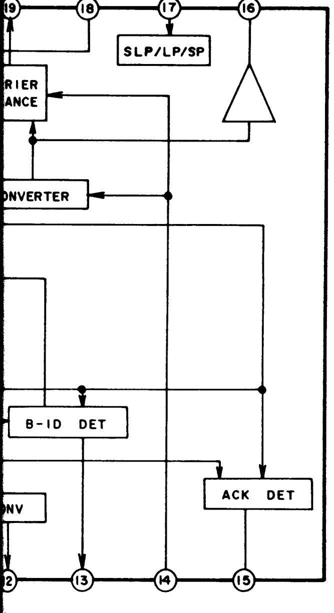
BA7107(SECAM CHROMA SIGNAL PROCCESSING IC)


REC EQ OUT
GND
LIM REF
LIM IN
Vcc
LIM OUT
RC2
SYNC IN
RC1
PB BELL OUT
PB BELL IN
MULT 1 REF
MULT 1 OUT
MULT 2 IN
28
27
26
25
24
23
22
21
20
19
18
17
16
15
REC SYNC GATE
LIM
÷4
R
P
PB SYNC GATE
SYNC GATE TIMING GENERATOR
P
R
X2
X2
R
P
R
P
R
P
1
2
3
4
5
6
7
8
9
10
11
12
13
14
BP EQ OUT
DIV OUT
REC5V
REC OUT
MULT 1 IN
RL
REC IN
MULT 2 OUT
BELL F
PB OUT
PB IN
RE
PB EQ
PB5V


E
D
C
B
A
1
2
3
4
TO MAIN PCB J302
TO MAIN PCB J3
P504
P505
SECAM CHROMA REC CURRENT
TO PRE AMP PCB P507
SECAM DET 1
SECAM DET 2
IC1 BA7025L
IC2 BA7025L
IC5 BA7107
BEEL FILTER
NOIS GATE
IC10 TC4066BP
IC4 TA8632N
IC3 TA8604N
IC6 BU4053B
VR4 PAL CHROMA REC CURRENT
VR7 NTSC CHROMA REC CURRENT
PAL SUB CARRIER
NTSC SUB CARRIER
NTSC CURRENT
REC LC
FSC
VI073A5030

VIDEO PCB VI073A5030

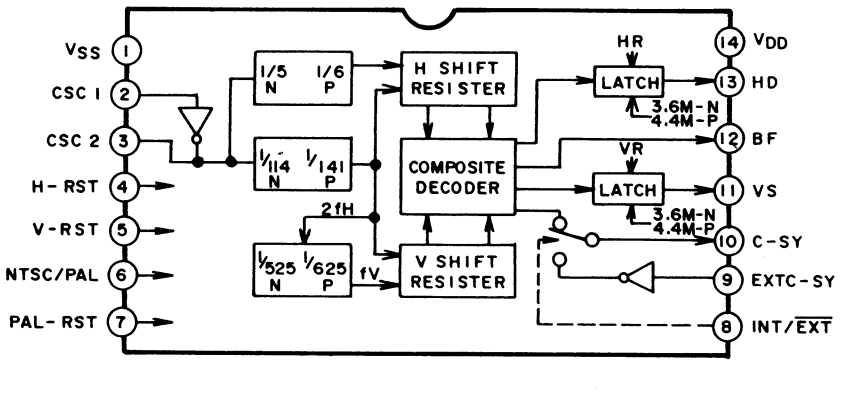
OCCESSING IC)


19
18
17
16
SLP/LP/SP
RIER
ANCE
NVERTER
B-ID DET
ACK DET
NV
12
13
14
15

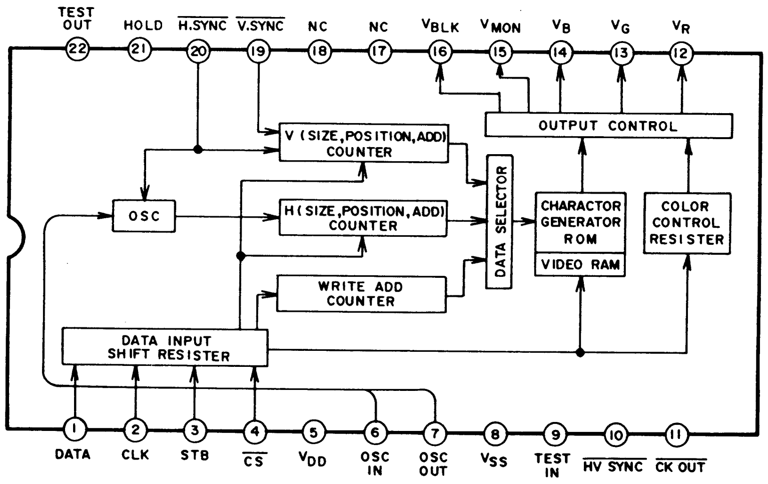
WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

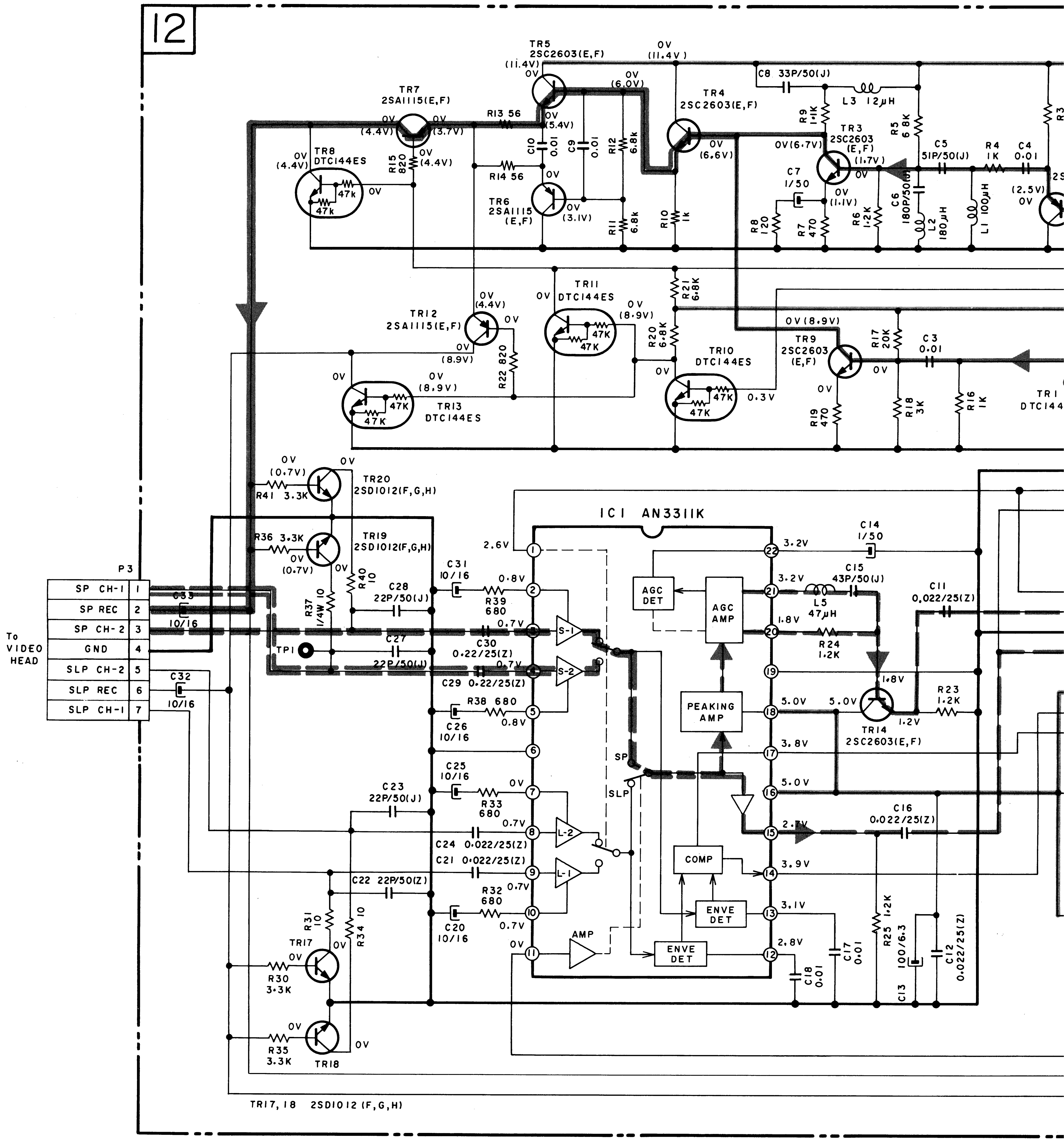
AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT.

TC9018P(TV SYNC GENERATOR)


VSS 1
CSC 1 2
CSC 2 3
H-RST 4
V-RST 5
NTSC/PAL 6
PAL-RST 7
INT/EXT 8
EXTC-SY 9
C-SY 10
VS 11
BF 12
HD 13
VDD 14
1/5 N
1/6 P
H SHIFT RESISTER
HR
LATCH
3.6M-N
4.4M-P
1/114 N
1/141 P
COMPOSITE DECODER
VR
LATCH
3.6M-N
4.4M-P
2fH
1/525 N
1/625 P
fV
V SHIFT RESISTER

μPD6105C(CHARACTOR GENERATOR)


TEST OUT 22
HOLD 21
H.SYNC 20
V.SYNC 19
NC 18
NC 17
VBLK 16
VMON 15
VB 14
VG 13
VR 12
OUTPUT CONTROL
V (SIZE, POSITION, ADD) COUNTER
OSC
H (SIZE, POSITION, ADD) COUNTER
DATA SELECTOR
CHARACTOR GENERATOR ROM
VIDEO RAM
COLOR CONTROL RESISTER
WRITE ADD COUNTER
DATA INPUT SHIFT RESISTER
1 DATA
2 CLK
3 STB
4 CS
5 VDD
6 OSC IN
7 OSC OUT
8 VSS
9 TEST IN
10 HV SYNC
11 CK OUT


A
B
C
D
E
F
1
2
3
4
5
6
7
8
12
TR5
2SC2603(E,F)
(11.4V)
0V
(11.4V)
TR7
2SA1115(E,F)
0V
(4.4V)
(3.7V)
R13 56
(5.4V)
(6.0V)
TR4
2SC2603(E,F)
C8 33P/50(J)
L3 12μH
R9 1.1K
TR3
2SC2603
(E,F)
(1.7V)
R5 6.8K
C5 51P/50(J)
R4 1K
C4 0.01
TR8
DTC144ES
47k
R15 820
C10 0.01
C9 0.01
R12 6.8k
(6.6V)
0V(6.7V)
C7 1/50
R14 56
TR6
2SA1115
(E,F)
(3.1V)
R11 6.8k
R10 1k
R8 120
R7 470
(1.1V)
R6 1.2K
C6 180P/50(J)
L2 180μH
L1 100μH
(2.5V)
TR11
DTC144ES
R21 6.8K
TR12
2SA1115(E,F)
(8.9V)
47K
R20 6.8K
TR10
DTC144ES
0V(8.9V)
TR9
2SC2603
(E,F)
R17 20K
C3 0.01
R22 820
TR13
DTC144ES
0.3V
R19 470
R18 3K
R16 1K
TR1
DTC144
(0.7V)
TR20
2SD1012(F,G,H)
R41 3.3K
R36 3.3K
TR19
2SD1012(F,G,H)
IC1 AN3311K
2.6V
3.2V
C14 1/50
C15 43P/50(J)
C11 0.022/25(Z)
R40 10
C31 10/16
0.8V
R39 680
C28 22P/50(J)
R37 10 1/4W
P3
SP CH-1
SP REC
SP CH-2
GND
SLP CH-2
SLP REC
SLP CH-1
1
2
3
4
5
6
7
To VIDEO HEAD
C33 10/16
C32 10/16
TP1
C27 22P/50(J)
C30 0.22/25(Z)
C29 0.22/25(Z)
S-1
S-2
AGC DET
AGC AMP
L5 47μH
1.8V
R24 1.2K
PEAKING AMP
5.0V
TR14
2SC2603(E,F)
R23 1.2K
1.2V
C38 680
C26 10/16
3.8V
C25 10/16
R33 680
SP
SLP
C23 22P/50(J)
C24 0.022/25(Z)
L-2
C16 0.022/25(Z)
C21 0.022/25(Z)
L-1
COMP
3.9V
C22 22P/50(Z)
R32 680
ENVE DET
3.1V
R31 10
R34 10
C20 10/16
AMP
TR17
2.8V
R30 3.3K
C18 0.01
C17 0.01
R25 1.2K
C13 100/6.3
C12 0.022/25(Z)
R35 3.3K
TR18
TR17, 18 2SD1012(F,G,H)

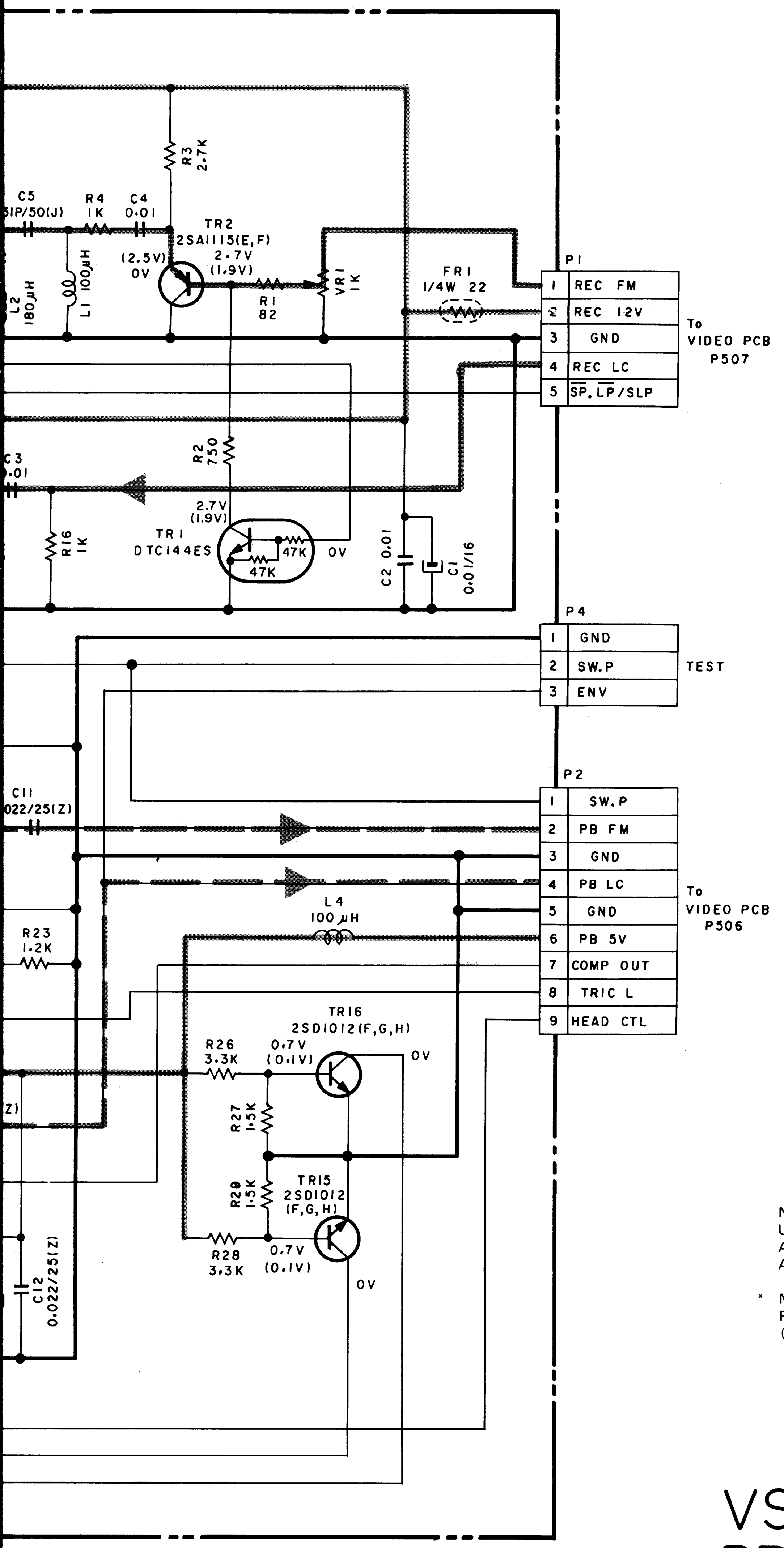
PRE AMP P

▬ ▬ ▬ : C-PB　　▬▬▬ : B(POWER SUPPLY) LINE

▬ ▬ ▬ : Y-PB

▬▬▬ : C-REC

▬▬▬ : Y-REC


C5
5IP/50(J)
R4
1K
C4
0.01
R3
2.7K
TR2
2SA1115(E,F)
(2.5V)
0V
2.7V
(1.9V)
R1
82
VR1
1K
L2
180μH
L1 100μH
FR1
1/4W 22
P1
1 REC FM
2 REC 12V
3 GND
4 REC LC
5 SP, LP/SLP
To
VIDEO PCB
P507
C3
0.01
R2
750
2.7V
(1.9V)
TR1
DTC144ES
47K
47K
0V
R16
1K
C2 0.01
C1
0.01/16
P4
1 GND
2 SW.P
3 ENV
TEST
P2
1 SW.P
2 PB FM
3 GND
4 PB LC
5 GND
6 PB 5V
7 COMP OUT
8 TRIC L
9 HEAD CTL
To
VIDEO PCB
P506
C11
022/25(Z)
L4
100μH
R23
1.2K
TR16
2SD1012(F,G,H)
R26
3.3K
0.7V
(0.1V)
0V
R27
1.5K
R29
1.5K
TR15
2SD1012
(F,G,H)
R28
3.3K
0.7V
(0.1V)
0V
C12
0.022/25(Z)

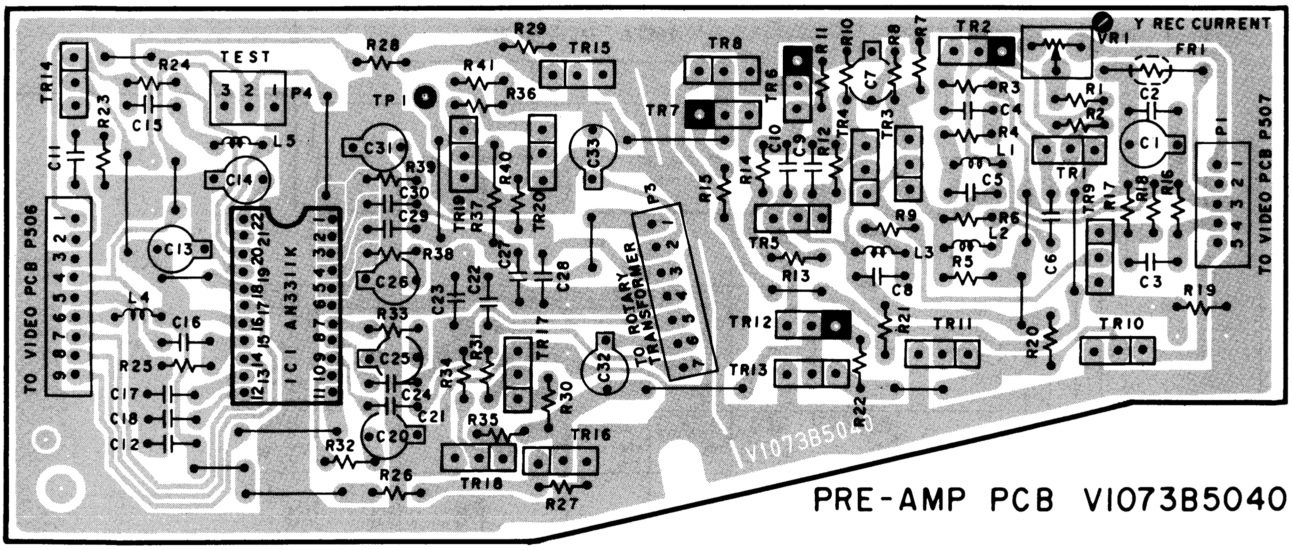
PRE AMP PCB V1073B5040

NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W (J)
ALL CAPACITORS IN μF 16WV (M)

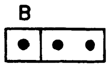
* MEASURED WITH THE DIGITAL VOLTMETER IN DC RANGE AT PLAY MODE.
( ): AT REC MODE.

VS-X9EGN
PRE AMP
SCHEMATIC DIAGRAM

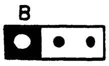
NO.7-6 870410A(A2)


TR14
R24
TEST
3 2 1
P4
C15
R23
C11
L5
C14
TO VIDEO PCB P506
1 2 3 4 5 6 7 8 9
C13
L4
C16
R25
C17
C18
C12
R28
R29
TR15
R41
R36
TP1
C31
R39
C30
C29
R38
C26
R33
C25
C24
C21
C20
R32
R26
IC1 AN3311K
TR19
R37
R40
TR20
C27
C28
C22
C23
R31
R34
TR17
R30
R35
TR16
TR18
R27
C32
C33
TR8
TR7
TR6
R11
R10
C7
R8
R7
TR2
VR1
Y REC CURRENT
FR1
C2
R3
C4
R4
L1
C5
R1
R2
C1
TR1
P1
TO VIDEO PCB P507
R6
L2
R5
L3
C8
R9
TR5
R13
TR4
TR3
R12
C9
C10
R14
R15
P3
TO ROTARY TRANSFORMER
TR12
TR13
R21
R22
TR11
R20
C6
TR9
R17
R18
R16
C3
R19
TR10
V1073B5040

PRE-AMP PCB V1073B5040

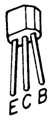


= NPN TRANSISTOR

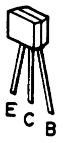


= PNP TRANSISTOR

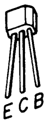
TR14 to 20 ------- 2SD1012
TR3 to 5, 9 -------- 2SC2603
TR2, 6, 7, 12 ------- 2SA1115
TR1, 8, 10, 11, 13 ------ DTC144ES



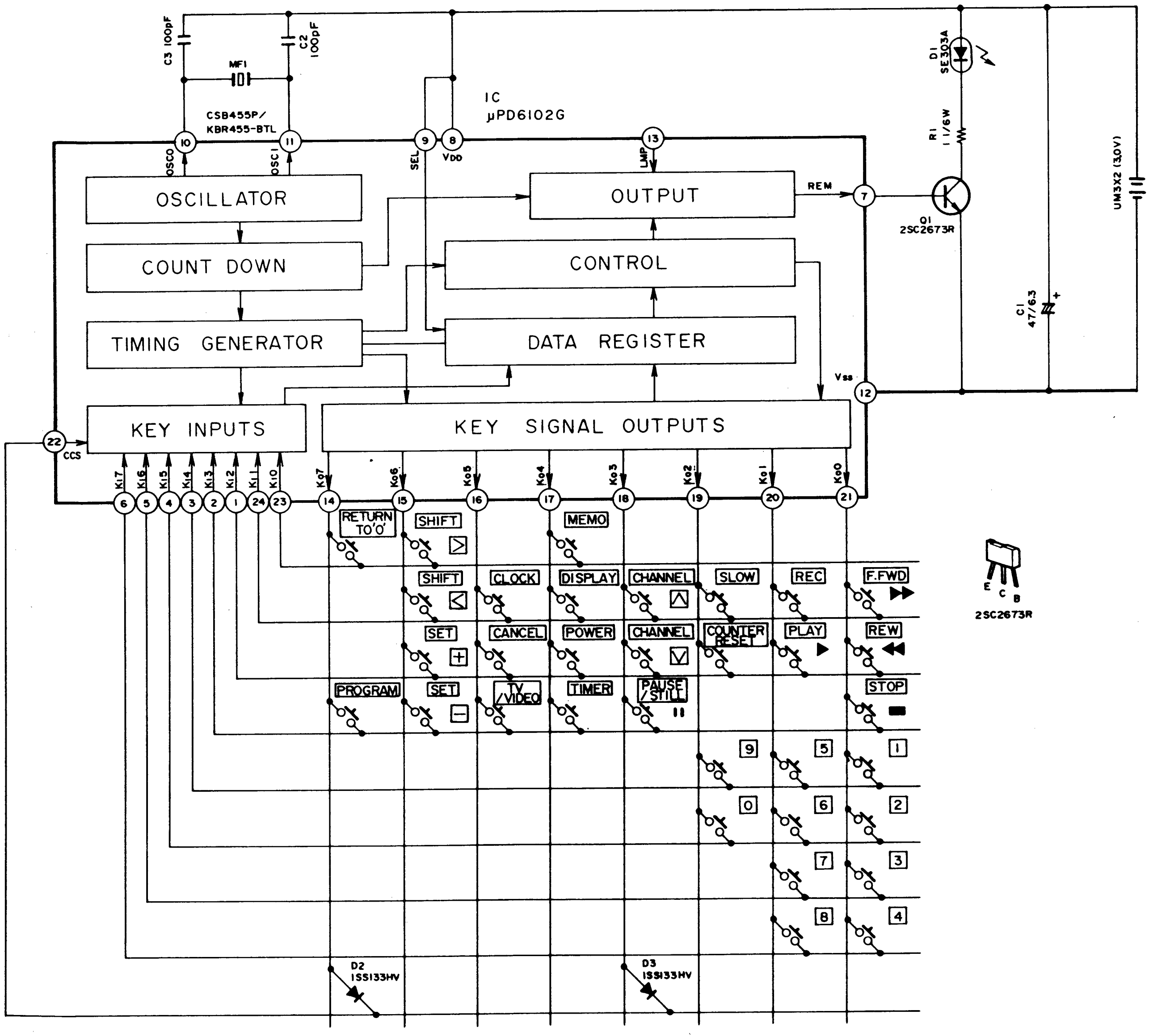
2SC2603
2SA1115



DTC144ES



2SD1012


C3 100pF
C2 100pF
MF1
CSB455P/
KBR455-BTL
IC
μPD6102G
OSCO
OSCI
SEL
VDD
LMP
REM
Vss
CCS
OSCILLATOR
COUNT DOWN
TIMING GENERATOR
KEY INPUTS
OUTPUT
CONTROL
DATA REGISTER
KEY SIGNAL OUTPUTS
Ki7
Ki6
Ki5
Ki4
Ki3
Ki2
Ki1
Ki0
Ko7
Ko6
Ko5
Ko4
Ko3
Ko2
Ko1
Ko0
D1
SE303A
R1
1 1/6W
Q1
2SC2673R
C1
47/6.3
UM3X2 (3.0V)
RETURN TO'0'
SHIFT
MEMO
CLOCK
DISPLAY
CHANNEL
SLOW
REC
F.FWD
SET
CANCEL
POWER
COUNTER RESET
PLAY
REW
PROGRAM
TV /VIDEO
TIMER
PAUSE /STILL
STOP
9
5
1
0
6
2
7
3
8
4
D2
1SS133HV
D3
1SS133HV
E
C
B
2SC2673R

RC-V240B
REMOTE CONTROL UNIT
SCHEMATIC DIAGRAM

NO.7-7 870232A